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TO

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Abbreviations: Abs. — Abstract: Ed. — Editorial.
Original Articles are followed by Author's name.

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PROTECTIVE INOCULATION AGAINST DISEASE.

E. F. McCAMPBELL, PH. D., M. D.

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When there is injected into the tissues of the animal body a foreign protein a definite chemical reaction occurs between the protein and the tissues of the body. The tissues produce substances in the nature of ferments which have the power of breaking down, disintegrating, and neutralizing the specific foreign proteins. When a specific bacterial protein or a group of proteins is injected into the body, the tissues are stimulated to form ferment substances which will break down and disintegrate the specific bacteria when introduced at another time. The ferment-like substances are excreted into the body fluids and have the power of producing their disintegrating action not alone in the body but also in the test tube when the blood serum is brought in contact with the specific bacteria or other protein. These phenomena have a distinct bearing upon the subject of protective inoculation and immunization. The fact stands out very prominently that the identical processes which take place during the course of an infectious disease, which may or may not result fatally, may be responsible for the production of an artificial immunity. By injecting small amounts of specific bacterial proteins it is possible to place the body in such a condition that when the same specific bacterial proteins are produced during the beginning of an infection, the bacteria will be disintegrated by the ferment-like substances which have already been produced. If this process of ferment action progresses slowly and the bacteria do not reproduce with too great rapidity in the course of the beginning of an infection, the body may be well able to handle the situation. The endotoxins which are set free by the ferment action may not be of sufficient concentration to produce any poisonous effect upon the body and may be readily excreted by the body cells. In other words, if the ferment substances are in sufficient concentration, the bacteria of a specific disease instead of being parasitic are rendered saprophytic and are then easily destroyed. Microorganisms to produce harm in the body must be able to multiply rapidly in spite of any resistance which may be offered by the tissues themselves, or the substances produced by the

tissues. In order to multiply rapidly they must have food in addition to moisture and proper temperature. All the cells of the human body produce compounds which are capable of disintegrating substances on which the cells feed. These substances are thrown out from the cells and are definite digestive ferments. There are also certain ferment substances in the cells which have the power of building up into usable food compounds those substances which have been disintegrated by the extra-cellular ferments.

In the beginning of any infection only a few micro-organisms are introduced. If there are present in the body ferments capable of disintegrating specific bacteria, such ferments having been produced by a process of gradual immunization, it will then be easy for such ferments to disintegrate the invading bacteria. A state of immunity or resistance then exists in the body. It should be remembered that it has been established that it is possible to make the body cells produce almost any ferment by careful immunization. As has been suggested by Fischer, Ehrlich and others it is possible to train or educate a cell to pour out a specific ferment which will have the power of disintegrating any specific substance. It is impossible for the supposed pathogenic microorganism to produce its pathogenic effect if it is attacked immediately upon entering the body.

It can, therefore, be stated that in the production of artificial immunity by inoculation the fluids and tissues of the body are so modified as a result of the ferment-producing substances which have been injected, that the invading microorganisms of the disease in question cannot grow and reproduce and are rapidly killed and disintegrated. Protective inoculation or vaccination against all diseases is accomplished by means of the same general processes. It should be recognized, however, that in many diseases it is impossible to secure the generation of sufficient amounts of ferment substances to completely destroy the invading microorganisms. In such cases protective inoculation as yet is not practical. It is quite possible that means may be devised before long by which the concentration of the so-called antibodies may be increased in those diseases which cannot now be vaccinated against.

Immunity brought about by an attack of a disease, by being inoculated with the causative microorganism or virus of a disease, or the antibodies produced during an attack of a disease or a vaccination, is designated as *acquired immunity*. This term is used in contra-distinction to natural immunity, in which the body possesses a natural resistance to disease due either to the bactericidal or anti-toxic properties of the body fluids or the phagocytic activity of the

body cells. Acquired immunity is characterized as being of either the active or passive type depending on whether there is a reaction of the body cells or not. It is known, for example, that an attack of plague, cholera, yellow fever, or typhus fever, confers an absolute and lasting immunity in man, subsequent infections never occurring. It is known also, for example, that second attacks of smallpox, chicken-pox, scarlet fever, measles, typhoid fever, syphilis, and mumps are extremely rare, and for all practical purposes it may be said that one attack usually confers a lasting immunity. There is, however, a large group of diseases which confer no particular immunity as a result of one attack. This group includes tuberculosis, malaria, tetanus, pneumonia, gonorrhoea, influenza, glanders, dengue fever, recurrent fever, beri-beri, infections with the pyogenic cocci, and diphtheria. In the case of this last mentioned disease, second attacks occur in a little less than one per cent of the cases (0.9%), and it has been established that 0.01 antitoxin unit per c. c. in the circulating blood protects against diphtheria. A certain per cent of individuals also have a natural immunity, a small amount of anti-toxin circulating in their blood normally.

It has been known since ancient times that in certain diseases an acquired active immunity was developed following an attack. However, it is not within the province of this paper to discuss other than artificially acquired immunity. We are concerned primarily with a consideration of that acquired immunity which results from an artificial inoculation. It is probable that the first observations on artificially acquired immunity were carried out in China and India many years before the advent of what may be called, in the broadest terms, rational or scientific medicine. The ancient practices in the above mentioned countries along these lines dealt almost entirely with smallpox. It was a common practice to artificially inoculate children with variolous material, or to place children in the beds which smallpox cases had occupied. It was noted that such artificially produced smallpox was usually mild and did not result fatally except in those individuals who were not in good health. In these instances an attack of real smallpox was produced but the general results and effects of the disease were considerably modified by the way in which the virus was introduced. It is well known, of course, that any infection may be modified depending upon the virulence of the infecting organism or virus, the number of the infecting microorganisms, or the concentration of the viruses, the avenue by which the infecting microorganism or virus enters the body, and the resistance or immunity of the individual infected.

Many years after, in 1796, Jenner made some observations on the relationship of cowpox to smallpox. He produced the first classical demonstration of the fact that it was possible to protect against a disease by an artificial inoculation of a modified virus. It has, of course, been practically established that cowpox is but modified smallpox. The passage of the virus through the bovine so modifies it that when this virus is inoculated artificially in man a somewhat different type of disease is produced. It is possible to produce cowpox in the bovine by the injection of smallpox virus. Again, it is possible to produce vaccinia by the inoculation of the human with the virus of cowpox produced as mentioned above. In other words, there are three possible sources for cowpox virus, namely, spontaneous cowpox in the bovine, or human smallpox or human vaccinia.

The experiments of Jenner are too well known to necessitate their discussion in a paper of this kind. Nearly a hundred years later, in 1880, Pasteur, while investigating the subject of chicken cholera, made use of the fundamental principles underlying the work of Jenner in establishing the method of protective inoculation against smallpox. For example, Pasteur noted that when the cultures of *Bacterium cholera gallinarum*, the cause of chicken cholera, were allowed to stand under aerobic conditions without transplantation, they diminished in their virulence. Subsequent inoculation of these cultures into fowls failed to produce the typical disease, only local abscesses resulting. Furthermore, he noted that when active virulent strains of the microorganisms were inoculated into these fowls infection was not possible. Pasteur investigated still further and developed a system of vaccination against this disease, consisting of the use of two vaccines with a twelve to fourteen day period intervening. For the "first vaccine" he used an almost completely attenuated culture of the microorganism, and for the "second vaccine" he used a mildly virulent strain. Fowls vaccinated by this method showed an absolute immunity to chicken cholera.

Following the experiments on protective inoculation against chicken cholera, Pasteur applied the information gained and the technique developed, to anthrax, a disease which at that time was quite common among the ruminants, such as sheep and goats, and which occasionally infected man usually with fatal results. He developed a system of protective inoculation against this disease. He experienced great difficulty in attenuating the very virulent *Bacterium anthrax*. Attenuation was accomplished by growing the microorganism at a higher temperature than its optimum (42—43 deg. C.). After the culture was attenuated so that it was not able to kill the

ordinary laboratory test animals such as rabbits, but was still able to kill guinea pigs and mice, it was made in the form of a vaccine and injected into the animals to be protected. After a period of from eleven to twelve days a second vaccine was given which was more virulent than the first, being able to kill rabbits, guinea pigs and mice, and after another period of fourteen days a highly virulent culture was given as a vaccine. It was found after these three inoculations that complete protection was afforded the animal.

It can be stated, then, that the experiments of Jenner and Pasteur constituted the beginning of all modern immuniological work, especially that phase of the subject which deals with the question of protective inoculation against disease.

Active immunity of the artificially acquired type may be brought about in several ways as follows:

(a) *Inoculation with Attenuated Living Cultures of Microorganisms.* Attenuation may be brought about (1) by growing causative microorganisms at temperatures higher than their optimum, (2) by heating the organisms to a temperature and for a length of time which nearly kills them, (3) by continually growing the organism on artificial media, (4) by passing the microorganisms through animals which are not highly susceptible, (5) by cultivating the microorganisms under pressure, (6) by adding chemicals to the cultures of microorganisms, and (7) by drying the microorganisms. For example, in the preparation of anthrax vaccine various workers have used the first, second, fifth and sixth methods. In the preparation of cowpox vaccine and tuberculosis vaccine, according to von Bering's method, the fourth method mentioned above is used. In the preparation of certain vaccines for chicken cholera, the third method is frequently used by some and this method and the second are also applicable to the preparation of vaccines for some of the pyogenic infections, such as those due to streptococci, staphylococci, etc. In the preparation of the rabies vaccine the seventh method is the usual one followed. In the preparation of diphtheria toxin for injection of animals where diphtheria antitoxin is to be produced the sixth method is sometimes used, terchlorid of iodine being the chemical used.

(b) *Inoculation with Virulent Cultures in Small Non-fatal Amounts.* This method has been used by some in connection with the preparation of anthrax vaccine and has also been employed by certain workers, such as Ferran, in making vaccines of *Microspira comma* for use in cases of human cholera. This procedure has also been used in certain experiments on the methods of vaccination against and the treatment of tuberculosis; the vaccination in this instance

beginning with one virulent microörganism on the first injection and the amount and numbers being increased from time to time thereafter. (Webb). Högyes' method of immunization against rabies involves the same principles. This worker used gradually increasing doses of high dilutions of virulent rabies virus. Small amounts of living virulent cultures have been used by Metchnikoff and Besredka, and also by Strong, in order to bring about an immunization against typhoid fever. Several workers, among them Gay, have recently been conducting a series of investigations on sensitized living cultures of the typhoid bacillus. Sensitization is accomplished by treating the live bacteria with a heated immune serum. Bacteria so sensitized are rapidly taken up by phagocytes, and it has been shown that under these circumstances they are unable to produce an infection but are able to produce an immunization.

(c) *Inoculation of the Dead Microörganisms and Extracts of Dead Microörganisms.* The method of inoculating dead microörganisms for the purpose of bringing about a vaccination is probably the most extensively used of any of the methods. Practically all the commercial vaccines which are now available are composed of dead microörganisms. The most extensively used of these vaccines and the one which will receive detailed consideration in this paper is anti-typhoid vaccine. Vaccines for plague and for cholera in which dead bacteria are used have also been prepared and are rather extensively used for the purpose of bringing about protection. The general method employed is to heat the bacteria to a temperature just sufficient to kill them, but not sufficient to destroy their antigenic properties. Vaccines composed of killed cultures of bacteria have been used rather extensively in the treatment of the pyogenic infections, such as rheumatism, acne, furuncles, and carbuncles, but it is not within the province of this paper to discuss the therapeutic uses of such a vaccine. The extracts of microörganisms have been used in certain instances rather extensively for the purpose of developing an immunity and bringing about a cure. Tuberculin is composed of the extracts of tuberculosis bacilli. This substance which has been prepared in a great many ways has been used rather successfully by some physicians in the treatment of certain forms of tuberculosis. Extracts of pneumococci prepared by treating these organisms with bile have been used in certain instances for the preparation of an antigenous compound to be injected for the purpose of preparing immune serum by actively immunizing animals, the immune serum thus produced being used in the treatment of pneumonia.

(d) *Protective Inoculation with the Toxic Products of Microorganisms.* It is well known that there are a few bacteria which are pathogenic to man which produce their deleterious effects by the soluble toxins which are generated. Diphtheria and tetanus are perhaps the two best-known diseases which are caused by bacteria producing soluble toxins. A great many experiments have been performed in which the soluble toxins of bacteria were supposed to have been used. In the early work on hog cholera, immunization was supposed to have been brought about by the soluble toxins of the specific hog cholera microorganisms. As a matter of fact it has been demonstrated that hog cholera is due to an ultra-microscopic virus and not to the bacterium first thought to be the cause of this disease or any toxin produced by it. It was also thought possible to produce an immunity to certain other septicemias occurring in animals and man by use of what was supposed to be the soluble toxins of the microorganisms. These experiments have not been at all successful.

No evidence has been brought forward to prove, for example, that tetanus toxin when injected is capable of producing enough antitoxin in the human body to guard against tetanus. It is well known, of course, that it is possible to use with good effect the antitoxin produced by immunizing animals to tetanus toxin. Antitoxin thus prepared will protect very efficiently against tetanus. It is not an efficient agent in the treatment of tetanus for the reason that the compound which is formed between the tetanus toxin and the nerve cells and other body cells is quite stable, and is not easily broken up notwithstanding the maximum affinity is always between toxin and antitoxin.

Up until recently we have had no evidence that the injection of diphtheria toxin in the human body would serve to protect that body against diphtheria. It is probable that a slight amount of antitoxin would be produced by such a procedure but that this antitoxin would not be in sufficient concentration to ward off an attack of the disease. Recently, however, it has been demonstrated by von Bering, who did the first work on diphtheria antitoxin, that a higher degree of protection is afforded against diphtheria when the individual is injected with a mixture of diphtheria toxin and diphtheria antitoxin. Heretofore, it has been usually the custom to use for the purpose of protective inoculation only diphtheria antitoxin. It has been shown that the combination above referred to creates a higher degree of immunity than when the antitoxin is used alone. Vaccines prepared by heating *Bacterium diphtheriae* to a low temperature also seem to

have some value in preventing the development of diphtheria. An increase in the opsonins is effected in this way.

Protective Inoculation with Antisera. There are two antisera which stand out very prominently as efficient preventives of disease. These two antisera are diphtheria antitoxin and tetanus antitoxin. These sera are produced as a result of the active immunization of animals with soluble toxins. On inoculation into man they produce a passive immunity, there being very little reaction on the part of the body cells generally as a result of the injection. The efficacy of tetanus and diphtheria antitoxins as prophylactics has long been established, and the results of their use are familiar to all progressive medical men. Practically all the other antisera which have been prepared, such as the anti-pneumococcus, anti-staphylococcus, and anti-streptococcus sera are used for therapeutic purposes and not as preventives. Their consideration is not, therefore, within the scope of this paper. However, attention should be directed to the fact that some observers have advocated the use of anti-streptococcus serum as a partial preventive of scarlet fever. It has been established by Köessler that scarlet fever is due to a filterable ultramicroscopic virus. Furthermore, it is well known that in the majority of cases of scarlet fever, especially those of a serious character, there is a concurrent streptococcus infection thereby increasing the severity of the primary disease to a very considerable degree. The streptococcus was supposed for a long time to be the cause of the disease inasmuch as it occurred so commonly in cases of this infection. Anti-streptococcus sera when used as a prophylactic does not completely protect against scarlet fever but a certain amount of protection is afforded against intercurrent infections with streptococcus. The general results are to be regarded, therefore, as favorable.

Typhoid Fever. The vaccine for the prevention of typhoid fever is perhaps the most widely known. The first work with anti-typhoid vaccines was done in 1896 by Pfeiffer and Kolle and by Wright and Semple. Beginning with 1898 antityphoid vaccines were used rather extensively among the British troops. The experiences at a somewhat later time, that is, during the Boer War, were not as encouraging as would have been expected. An investigation showed that in all probability this was due to the overheating of the vaccine. Since 1904 an improved vaccine has been used among the British troops with good effect. Antityphoid vaccination was begun among the troops in the United States in 1908. Beginning with 1909 there has been a steady decrease in the number of cases of typhoid fever in the United States troops. In 1913 the case rate was 5 per 100,000

with no deaths. The civil death rate in the registration area of the United States was 17.9 per 100,000 in 1913. The experiences since this time have demonstrated absolutely the efficacy of the vaccine to the satisfaction of all careful observers. The method now used by most laboratories in preparing vaccine is as follows: Vigorous cultures of *B. typhosus* are grown on agar media for a period of twenty-four hours and then washed off in a normal salt solution. The culture is then standardized to determine the number of bacteria and heated to 56 deg. C. for one hour, and 0.25 per cent. tricesol is usually added as a preservative. This vaccine seems to give uniform results. Wright thinks that vaccine heated to 53 deg. C. gives better results. Recently much attention has been given the preparation of sensitized or opsonized vaccines (Besredka's Method). Cultures of *B. typhosus* are mixed with the serum of an animal which has been immunized against the typhoid bacillus, or with human serum from a person who has recovered from typhoid fever. The serum-bacteria mixture which is polyvalent, several strains of bacteria being used, is incubated at 37 deg. C. after which the bacteria in the vaccine are washed and suspended in normal salt solution. The bacteria in the vaccine are not heated at all. When such a vaccine is injected it is supposed that the bacteria which it contains are more rapidly broken up than is the case where they are not sensitized. The opsonins have already sensitized the bacteria and the phagocytic ferments easily destroy them. It is supposed further that the body cells react with greater avidity to the liberated endotoxins, and consequently produce more antibodies. Similar results are obtained by using the ground-up sensitized typhoid bacteria. Sensitized vaccines give the best results when given at intervals of two days.

Antityphoid vaccine is usually given in three injections, a seven-day period intervening. The first dose is usually composed of 500,000,000 bacilli, and the second and third doses of 1,000,000,000 bacilli each. The doses are somewhat reduced for children, although children tolerate the vaccine even better than adults. At the present time it may be stated that the efficiency of antityphoid vaccination has been firmly established by the results of a large series of inoculations. The literature on the subject is growing to be quite voluminous. It is impossible in a paper of this character to include an exhaustive study of the literature which is readily accessible. There are certain phases of the inoculation technic which have been developed and which if followed seem to give the most satisfactory results. It is now generally agreed by the most careful observers that every individual who is to be inoculated should receive certain treatment pre-

liminary to the injection and certain care after inoculation. In the ordinary robust individual the injection of typhoid vaccine is attended by very little disturbance. There is usually some tenderness at the site of inoculation and occasionally a slight amount of pain and edema. The constitutional symptoms usually are quite slight, involving possibly headache, malaise and slight fever. In those persons who possess a constitutional weakness, or who are not vigorous, there may be in addition some nausea, vomiting, and higher fever. Woodhead and Leishman, of England, have made very careful observations of the clinical phenomena attendant upon typhoid vaccination and have made certain definite recommendations. These observers have had ample opportunity recently to make still further studies among the men of the British Army who are being inoculated before being sent to the front in the present war. They think it highly desirable for the patient who is to be inoculated with typhoid vaccine to take a saline cathartic for two nights and a complete rest for twenty-four hours preceding the inoculation. The diet should be very simple, milk being the principal article. Alcohol and all stimulants should be prohibited. After the inoculation the patient should remain quiet and in bed if possible for at least a day. A light diet should still be given and stimulants avoided. It has been noted that there is no specific "negative phase" when the bacteria in the vaccine are thoroughly washed (Wright). It was formerly supposed that there was a definite "negative phase" following at least the first and second injections of the vaccine, the opsonins and the bactericidal substances being reduced in concentration. The general effect on the body seems to be due to the disturbances brought about by the absorption of foreign material, interference with the excretion of waste products, the altered tissue reactions, and the increased temperature. The period of time between inoculations should not be over ten days, as after this time the body may be considered to be in a state of anaphylaxis or hypersusceptibility, so that when the second injection is given more serious symptoms may ensue. It seems, and it is now the consensus of opinion, that the plan outlined by Woodhead and Leishman gives the best results and causes the immunity to rise much more rapidly than in the cases where no attention is given to the patient before or after treatment. Another point should be mentioned in this connection, and that is the site of selection for the injection of the vaccine. For a long time it has been supposed that the best place to make the injection was in the arm at the insertion of the deltoid muscle. It is, of course, necessary to prepare the site of inoculation aseptically. Recently, evidence has been

brought forward which would indicate that more uniform results are obtained by the injection of the vaccine subcutaneously underneath the right or left clavicle.

Cholera. At the present time cholera is occurring in several of the countries at war, notably Russia, Austria-Hungary, Turkey, and in certain of the war-prison camps of Germany. As referred to previously, Ferran over thirty-five years ago first attempted to protect against cholera by vaccination. Ferran used impure cultures obtained from human cholera cases and the results were not altogether satisfactory although they indicated the possibilities of work along this line. The first successful work was done by Haffkine in India. In this work he followed the method of Pasteur in preparing anthrax vaccine. He used two vaccines, in one of which the bacteria were completely attenuated and in the other the bacteria were slightly more virulent than in the first vaccine. It seems, however, that the best results are to be obtained by the use of cultures completely killed at a low temperature. Kolle was the first to use this method and his results are seemingly just as satisfactory as those of Haffkine. There is not the added danger of using a live culture which might possibly produce an infection. Kolle's vaccine is given subcutaneously in two injections of 1 and 2 c. c., respectively, a period of seven days intervening, and the Haffkine vaccine is given in the same way with an interval of five days. The local effects are usually quite marked but these disappear within 36 to 48 hours. The constitutional symptoms are usually marked, there being a rise in temperature and, in a certain per cent of the cases, a transient diarrhoea. The symptoms usually disappear within three days. The protection afforded by either the Haffkine or Kolle vaccines is not at all complete. The liability to infection is materially reduced but when the disease occurs in a vaccinated person, the immunity appears to be only partial and in many instances does not materially modify the cause of the infection. Many statistics have been collected in those countries where cholera is endemic, or in which it has occurred in epidemic form, and the evidence is conclusive in the support of the contention that protective inoculation should be practiced. These vaccines have been thoroughly tried out in India, Russia and Japan. For example, among 77,907 persons vaccinated during an epidemic in Japan in 1902, only 0.06 per cent developed cholera and of these 0.02 per cent died. The statistics from Russia and India are equally conclusive.

Plague. The plague is at the present time quite widely distributed in North America. There are three foci, New Orleans, Se-

attle, and certain of the rural districts of California. This year the plague has occurred in Cuba and has also been reported in Peru, Ecuador, and Brazil in South America. In the closing months of 1914, the plague appeared in Italy, Greece, England, and Portugal. The disease is also present in Egypt, German and British East Africa, Russia, India, China, Ceylon, Siam, Persia, Turkey, and the Dutch East Indies. It has also recently occurred in the Philippine and Hawaiian Islands.

Plague is essentially a disease of rodents, being transferred from rat to rat and from rat to man by the agency of the flea. The disease is not confined to one species of rat or its transmission to one species of flea. The prevention of plague is essentially a proposition involving the elimination of the rat. It is necessary, of course, to fumigate thoroughly all ships arriving from plague-infected ports, with some agent which will destroy the rats. More essential, however, than fumigation of ships is the rat-proofing of all wharves and water fronts. Rats brought ashore from vessels will, therefore, find no means of protection and will in many instances, as has been pointed out by Rucker, take passage on outgoing vessels. Rucker further called attention to the fact that fumigation is an expensive make-shift. He states that every case of human plague costs the community at least \$7,500, and every case of rodent plague costs the community at least \$5,000, and that it is not possible to estimate the losses brought about by quarantine and the diversion of commerce. He calls attention to the fact that it is not only necessary to rat-proof all water fronts but that all premises, especially in port towns, should be also thoroughly rat-proofed. Without doubt Rucker is correct when he says that plague menaces every port in the United States because of the present distribution of the disease over the world. There is no question but that this menace will be materially increased with the close of the present war.

In addition to the general sanitary measures which should be followed, a certain amount of protection may be afforded by the use of plague vaccine. The vaccine most used at the present time is that first prepared by Haffkine. The vaccine is prepared by growing pure cultures with *Bacillus pestis* at 25 to 30 deg. C. for five or six weeks, the cultures being shaken periodically. After the growth has been completed the culture is thoroughly shaken and sterilized by heating to 65 deg. C. for one to three hours. A solution of 0.5 per cent phenol is added as a preservative, the vaccine tested for sterility, and then bottled in sterile containers in the varying amounts.

Many other types of vaccine have been prepared but none seem to give the same satisfaction as that prepared according to the method of Haffkine. The German Plague Commission recommends the use of 24 to 48-hour agar cultures of *Bacillus pestis*, instead of those in which the organisms are grown over a longer period of time. Kolle and Strong have also employed living cultures of reduced virulence and Lustig and Galeotte have employed the toxic precipitates which result from dissolving the plague bacilli in caustic potash and neutralizing with one per cent of acetic acid. Terni and Bamby have prepared a vaccine which is made by growing *Bacillus pestis* in the peritoneal cavity of either rabbits or guinea pigs. After the death of the animals the peritoneal exudate is collected and incubated for twelve hours, after which the bacteria are killed and a preservative added.

The Haffkine vaccine is given to adults in doses of 2 to 3.5 c. c., the injections being given subcutaneously and all aseptic precautions taken. After eight or ten days a second injection is given, but is slightly increased in amount. The effects of the vaccination are somewhat more intense than that attendant upon typhoid vaccination. The immunity which results usually lasts about three months. In plague infected countries, therefore, it is necessary to vaccinate at least three or four times a year. Vaccine has little preventive effect against the pneumonic form of plague, but in the bubonic form the results are more satisfactory. It is stated that the mortality among inoculated persons is 11 to 41 per cent, as against 50 to 92 per cent among those who have not been vaccinated. It can be seen, therefore, that the protection is not absolute. The vaccine is not effective after the disease has developed. Some observers have recommended the use of antiserum and vaccine together when there is a particular danger of infection. This is also the recommendation of the India Plague Commission.

Rabies. It is, of course, well known that Pasteur in 1880 discovered the fact that rabies could be prevented by gradual inoculations with attenuated rabies virus. Since this time quite a number of different methods of protective inoculation have been introduced. All of them, however, which are successful are modifications of the original method of Pasteur. Pasteur's method, it will be remembered, involved the passage of the virus of the disease through a series of rabbits until such time as it became "fixed", and on inoculation would kill a rabbit with a fair degree of regularity every six or seven days. The spinal cords of rabbits killed with "fixed" virus are dried over caustic potash. Drying reduces the virulence of the virus. In the

ordinary case a series of twenty-one treatments are given on different days, beginning with the injection of a salt solution emulsion of the spinal cord of a rabbit which has been dried for 14 or 15 days. The virus is usually killed completely by drying 16 to 18 days. The amount of the emulsion injected is usually 2.5 c. c. The injection is usually made subcutaneously at various points under the skin of the abdomen. On each successive day a cord or mixture of cords which have been dried a less amount of time is used, until on the twenty-first day, a cord which has been dried two days is used. In cases where there have been severe bites, the treatment ("intensive") is often given twice a day and the more virulent cord consequently given for several days toward the end of the course of treatment. Various modifications have been proposed. One of the most successful is that which begins with a seven or eight day dried cord and runs down to a one day cord. In this instance it is necessary, of course, to give the one day dried cord for almost two weeks in the average case. As referred to previously, Högyes prepares a vaccine by the use of virulent virus obtained from the cerebrum. The virus is first given in very high dilutions and then the concentration increased. The method cannot be regarded as highly successful. The most success has attended the use of the straight Pasteur treatment or some modification thereof. The efficacy of vaccination against rabies has long been established. Among uninoculated persons about 16 per cent develop the disease and the average among those who have received protective inoculation is about 0.46 per cent. The liability of infection varies, depending upon the location and the severity of the bite; bites on the face and head being the most dangerous. The liability of infection also varies somewhat with the character of the animal which inoculates the virus. For example, infections from the bite of the wolf occur in about 40 to 60 per cent of cases among uninoculated persons, and in about 10 per cent of cases in inoculated persons. It is necessary, of course, to give immediate attention, if possible, to local wounds. The best disinfectant for this purpose is a fuming nitric acid.

Vaccines for Other Diseases. Attempts have been made to vaccinate against cerebrospinal meningitis and dysentery of the bacillary type. In the former it has been found that a moderate degree of immunity may be effected which will completely protect against the disease. The duration of the immunity, however, is short. The polyvalent vaccine is used which has been heated only to 50 deg. C. Three injections are given of 100,000,000, 500,000,000 and 1,000,000,000 meningococci with a seven-day period intervening. It will be neces-

sary to have more extensive observations made during the course of epidemics in order to thoroughly establish the efficacy of this vaccine. The method followed in the protective inoculation against dysentery is that of mixed active and passive immunization. The vaccine is made in the usual manner using the dysentery bacillus and is mixed with the serum of an animal immune to dysentery. Shiga states that while no particular reduction was noted in the incidence of cases, that there was a decrease in the mortality. At the present time, therefore, this method may be used with more success as a therapeutic agent rather than as a prophylactic.

The fact that typhus fever is epidemic among certain of the European countries now at war, has been previously referred to. There has not been such a wide diffusion of this disease since 1846-1847, and before this not since the Napoleonic wars ending in 1815. Endemic typhus fever or Brill's disease is present in this country pecially along our eastern seaboard continuously. Not infrequently cases of typhus fever are taken off the vessels at our quarantine stations. Following the close of the present world war most vigorous precautions will have to be exercised to prevent the entrance of this disease in its severe form. The disease also occurs in Mexico and so far our health authorities have been successful in preventing its entrance into this country. In order to set up a satisfactory barrier against this and other diseases after the close of the foreign war, it will be necessary for our health authorities to pay attention not alone to the immigrants who come into this country through our various ports of entry, but careful supervision will have to be exercised all along the northern and southern borders where the passage of individuals back and forth is more or less free. With the return to Canada of the troops now serving in the war, undoubtedly various infectious diseases will be introduced unless most rigorous quarantine on the part of the health officials of this country is exercised.

In regard to typhus fever it may be said that the cause of this disease has not yet been established beyond all question. Several observers, among them Anderson and Goldberger, Ricketts and Wilder, and McCampbell and Conneff, have described certain organisms which occur in the blood during the course of the infection. Repeated attempts on the part of these workers to cultivate the organism were not successful. Recently, a young observer, by the name of Plotz at Mt. Sinai Hospital, New York City, has reported the isolation and cultivation of a small bacillus from cases of true typhus fever and from cases of Brill's disease. This observer has stated that the organism can be grown in pure cultures anaerobically. The ex-

periments so far reported are not entirely conclusive and are to be regarded as very preliminary. Plotz has conducted some experiments on laboratory animals with a vaccine prepared from cultures of the bacillus isolated. He reports that this vaccine prevents the occurrence of typhus in the experimental animal. It is reported further that certain inoculations have been made among individuals who are going from this country into the typhus infected area. Typhus fever is transferred from man to man principally through the agency of the body louse, and also the head louse, although the secretions and excretions of the body in certain instances contain the infecting micro-organisms. The development of a vaccine which would prevent the occurrence of the infection would be highly desirable. However, at the present time its prevention turns largely to the question of the elimination of the louse. This may be accomplished by strict attention to personal cleanliness and by the use of certain well-established insecticides, such as sulphur.

Among animals protective inoculation has been practiced with success against anthrax, systematic anthrax or black leg, sheep pox, rinderpest, rabies, swine erysipelas, and bovine pleuro-pneumonia. It is impossible in this paper to discuss in detail animal protective inoculation. Suffice it to say that in certain instances the methods are quite crude and the results obtained are variable. However, on the whole it may be stated that marked progress has been made and that protective inoculation against the animal diseases has the same future before it as protective inoculation against human diseases.

Many of the leading countries of the world are now at war. This list of belligerents includes, England and her colonial possessions, including Canada, Australia, New Zealand, India, Egypt, and also her African colonies; France and her colonial possessions, including Algeria, and French West Africa; Belgium and her African possessions; Russia; Japan; Servia; Montenegro; Italy; Germany and her colonial possessions; Turkey and Tripoli; and Austria-Hungary. Furthermore, there are other countries on the verge of entrance into the great world conflict. As yet there are no signs of peace. Large numbers of combatants are being killed and wounded. With the opening of spring many cases of infectious disease of different forms appeared at various points in addition to those epidemic diseases which had already developed during the six months preceding. Epidemics of cholera, dysentery, typhoid fever and typhus fever have developed in certain of the nations at war. Some of these nations have been leaders in the development of sanitary science during the last decade, while others have contributed to the pro-

gress only to a limited degree. However, the knowledge gained has been available to all countries and the only difference noted is that certain nations have attempted to make a practical application of the information gained while others seemingly have not been active in general public health work. Nevertheless, knowledge as to the means of preventing disease may be at hand but various factors may operate during a war such as is being waged which will make the complete practical application of such knowledge well nigh impossible. In a war such as is now going on it is extremely difficult to bring about the enforcement of all the recognized principles of sanitation at all times. Such work is of fundamental importance, however, for in all previous combats disease has taken a heavier toll than bullets and shells.

Following the close of the present world war immigration will resume its usual course and there is no question but that the number of immigrants coming to this country will be greatly increased with the attendant danger of introducing epidemic diseases. The Panama Canal will bring this country into closer contact with the countries of South America and Asia where certain tropical and other epidemic diseases prevail.

In order to guard this country against the introduction of epidemic diseases our maritime quarantine must be made as nearly perfect and adequate as possible. This is a matter which concerns all the states. It is a matter of national importance. The Federal Government should have complete control of all quarantine at our ports of entry. At the present time this is true with few exceptions. The ports of New York and Baltimore are the chief ones remaining under state or local control. A movement is now under way to place these ports under federal supervision. Every state should encourage the accomplishment of this transfer. The United States Public Health Service, with its domestic and foreign quarantine stations, has well demonstrated that it is entirely efficient and adequately equipped to guard our interests. It is important, however, that we in this country and in this state should not rely too extensively on the efficiency of our federal health agencies. As health officials and as physicians it is our well-defined duty to exhort all the citizens of the various communities to use every effort to protect against diseases by prophylactic inoculations where possible and to give attention to the recognized principles of hygiene and sanitation. The threatening foreign situation and our new commerce relations made possible by the Panama Canal only serve to emphasize what we already know and have had demonstrated in regard to the necessity of paying at-

tention to sanitation and preventive inoculation. Preventive inoculation against disease should never be allowed to take the place of general sanitation among the inhabitants of a community. Both should be utilized to the fullest extent in order to afford the fullest degree of protection.

COURT DECISIONS RELATING TO MORBIDITY REPORTS.*

The Right of the Community to Require Physicians to Report Cases of Disease Coming Under their Observation and the Purposes Thereof and Reasons Therefor as Stated by Courts of Last Resort.

Laws requiring the notification of the occurrence of cases of disease are of comparatively recent origin, but the necessity for the protection of the community by securing prompt reports of cases of at least the communicable diseases is now generally recognized. The large number of laws requiring the reporting of cases of communicable and industrial diseases which have been enacted during the last few years makes it important that health officers and others responsible for the enforcement of these laws should be familiar with the construction placed upon them by the courts.

It is well settled that laws, ordinances, and regulations having for their object the protection of the public health are to be so construed as to make them effective for the purpose intended, as far as possible. The Supreme Court of the United States in *Dobbins v. Los Angeles* (195 U. S., 223, at p. 235), said:

It may be admitted that every intendment is to be made in favor of the lawfulness of the exercise of municipal power making regulations to promote the public health and safety, and that it is not the province of courts, except in clear cases, to interfere with the exercise of the power reposed by law in municipal corporations for the protection of local rights and the health and welfare of the people in the community.

The opinion of the same court in *Reduction Company v. Sanitary Works* (199 U. S. 306, at p. 318) contains the following statement:

It may be taken as firmly established in the jurisprudence of this court that the States possess, because they have never surrendered, the power—and therefore municipal bodies, under legislative sanction, may exercise the power—to prescribe such regulations as may be reasonable, necessary, and appropriate, for the protection of the public health and comfort. * * * Equally well settled is the principle that if a regulation, enacted by competent

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public authority avowedly for the protection of the public health, has a real, substantial relation to that object, the courts will not strike it down upon grounds merely of public policy or expediency.

Not many cases bearing directly upon the reporting of the occurrence of disease have been decided by courts of last resort. This is probably due to (1) the fact that laws requiring the notification of diseases are of comparatively recent origin; (2) physicians are reluctant to appeal cases because of the publicity thus given to the fact that they have violated the law, and (3) the small fines usually imposed in cases of this class make the expense of an appeal seem large in comparison with the loss sustained by paying the fine. However, the cases cited below serve to show that the constitutionality of reasonable laws, ordinances, and regulations requiring the notification of diseases is well established, and that reports must be made within the time and in the manner required by the law.

When the law makes it the duty of a physician to report cases of disease he is protected in the performance of that duty, and a physician is not liable in damages to a patient if he in good faith reports a case to the health officer as a contagious disease, though the patient is removed to an isolation hospital because of such report, and it is later proved that the diagnosis was incorrect. (*Brown v. Purdy*, 8 N. Y. St. Rep., 143.)

The leading court decision regarding the reporting of cases by physicians is *State v. Wordin* (56 Conn., 216), which was decided December 1, 1887. In that case a physician was prosecuted for the violation of an ordinance of the city of Bridgeport, Conn., which provided that physicians must report cases of "infectious or pestilential disease." The defendant was charged with neglecting to report a case of diphtheria which he attended. He was found guilty and fined.

He appealed, claiming that the ordinance was inoperative and void because (among other reasons) it was unjust and unreasonable, inasmuch as it took professional knowledge for which it paid nothing, interfered with the physicians' lawful business, and imposed a public burden upon a class.

The court (Pardee, J.) said:

In conferring authority upon the legislature of the city to pass the ordinance the legislature of the State was in the performance of its duty and in the exercise of its power to protect its citizens from exposure to contagious, fatal diseases.

Of absolute necessity this power inheres in every organized community; otherwise there would be only organized suicide. It takes unwritten precedence

of all provisions for the protection of rights of property and includes the right to require as much of the services or property of each as may be necessary to the preservation of the lives of all, without provision for payment therefor. * * *

Is an ordinance which requires one to lose a small portion of his time that the lives of many may be saved offensive to the constitution? An ordinance requiring the person who in the night season should first discover a dwelling house in the city, to be on fire to turn aside and arouse the inmates and sound the alarm without compensation would not shock anyone. Nor, we think, does one requiring the person who first discovers in a crowded street the presence of a contagious, fatal disease to notify without compensation the official charged with the duty of preserving health and protecting life therein. If to compel this gratuitous service is to violate the principles of the social compact, it would be better to dissolve and reorganize. * * *

In his concession that the ordinance would be valid in the ravages of pestilence, under presence of an overwhelming necessity to prevent public calamity, the defendant concedes the whole case. An ordinance of this character must be intensely practical; a proper regard for human life demands that a contagious, fatal disease shall be barred rather than driven out.

The inequality of burden of which the defendant complains is only in seeming. Persons offering their services to the public as healers of disease and requiring pecuniary compensation therefor, thereby assert their ability to detect the presence of it when the great mass of the people can not. The people accede to the truth of their assertion, and in the matter of life surrender themselves to their keeping. Of course an ordinance in the interest of life must detect the presence of a fatal contagious disease at the earliest possible moment. Therefore with impartial action it compels that member of the community who is the first to have sight and knowledge of it to give note of warning to others from whom its presence is hidden. It would be idle to require, indeed there would be danger in accepting, this service from those who can not see or do not know. The burden is made to rest upon every member of the only class which is in a condition to contribute anything to the accomplishment of the purpose of the ordinance.

People v. Brady (90 Mich., 459), was decided in 1892. The defendant was a physician, and he was charged with failure to report cases of diphtheria which he attended.

The evidence showed that the defendant had admitted to different persons that the cases he had not reported were diphtheria, and he had stated that he would not report cases, but "a week or ten days" after diagnosing the cases in question as diphtheria, he verbally notified the health officer.

The court held that this notice "was not the notice required by the statute, which is to be in writing, giving the name, place of residence, and nature of the disease."

The court also held that a delay of eight days in cases like diphtheria, where the disease is virulent and rapid in its action, was unreasonable.

Another Michigan case was that of *People v. Shurly* (124 Mich., 645; 131 Mich., 177). The first decision was rendered in 1900, and the second in 1902. The question involved in this case was whether the language of the statute requiring reporting of communicable diseases included tuberculosis. The statute defined the diseases as follows: "Smallpox, cholera, diphtheria, scarlet fever, or any other disease dangerous to the public health."

The court held that the question whether tuberculosis was a disease "dangerous to the public health" within the meaning of the statute was a question of fact and that it should have been decided by the jury.

On the second trial the jury found that tuberculosis was dangerous to the public health, but that it was not to be classed with the other diseases named in the statute. The court then held that "the question whether consumption is to be classed with smallpox, scarlet fever, measles, cholera, and diphtheria should not have been submitted to the jury. If the disease is contagious and dangerous to the public health the law classifies it."

The defendant in the case of *Chicago v. Craig* (172 Ill. App., 126), which was decided in 1912, was a physician practicing in the city of Chicago. Shortly after 10 o'clock at night a man suffering from smallpox came to his office for treatment. The physician attempted to communicate by telephone with the city health department, but failed to get any response. He then gave the patient a card of introduction and told him to present it the next morning to the chief of the bureau of communicable diseases. The patient reported at the bureau at 2 p. m., the next day and presented the card. The physician did not report the case to the health department.

Suit was brought by the city to recover a penalty for the violation of the ordinance and rule requiring the reporting of communicable diseases by physicians, and a judgment of \$25 and costs was secured against the defendant.

On appeal he contended that he had in effect complied with the ordinance and rule.

The court (Graves, J.) said:

Section 1072 provides that physicians attending cases of smallpox shall report the same in writing to the commissioner of health within 24 hours after first discovering the existence of such disease, which report shall give the name, if known, and the place of dwelling of the persons having such disease, "together with the character and state of his disease."

Rule 1 provides that such physician shall report such case at once "to the department of health by telephone and by mail."

Whatever might be said as to whether the unsuccessful attempt made by plaintiff in error to notify the health department of this case by telephone was a part performance of the requirements of rule 1, referred to, the record is barren of any evidence of even the slightest attempt on the part of plaintiff in error to comply with section 1072, requiring a report in writing "giving the character and state of the disease," or with rule 1 requiring a report by mail to the department of health. It is no answer to a charge of failure to comply with the provisions of the ordinance and rule to say that plaintiff in error sent Mitchell to the health department, or that the health department became aware of the facts upon investigation after Mitchell presented himself in pursuance to the directions of plaintiff in error, or that sending Mitchell to the health department was just as effective a way to notify the health department of the facts as the way provided by ordinance and rule. It was clearly within the province of the legislative department of the city government to enact in what way notice of such disease should be given to the health department, and having done so it is the duty of all persons coming within the provisions of such ordinance and rule to obey them, and it will not do to allow individuals, although members of the medical profession, to say some other way is just as good.

That plaintiff in error undertook to substitute his way of notifying the health department of this smallpox case for the way provided by ordinance and rule, and utterly failed to comply with the provisions of the ordinance and rule in that regard, is clearly established by the evidence.

In *State v. Pierce* (88 Atl., 740) a Vermont case decided in 1913, the defendant, a physician, was convicted of failing to report a case of diphtheria, as required by the statute. It appears that his defense was that he had not recognized the case as diphtheria. The statute required a physician who knew or suspected that a patient was suffering from a dangerous communicable disease to report the case. It therefore became necessary to prove that the defendant knew or suspected that the patient was suffering from diphtheria. The court held that in order to establish this fact it was proper to admit testimony that there had been other cases of diphtheria in the vicinity, that houses had been quarantined and placarded (the circumstances being such that the defendant must have been cognizant of these facts), and that the defendant had had knowledge of autopsies performed upon other patients and laboratory reports of bacteriological examinations which indicated that diphtheria existed in the community. These were held to be facts which it was proper to submit to the jury and from which the jury properly drew the inference that the defendant knew or suspected that the case he failed to report was diphtheria.

The decisions in *Johnson v. District of Columbia* and *Kansas City v. Baird*, *infra*, show the necessity of exercising care in drafting laws providing for reporting of diseases.

Johnson v. District of Columbia (27 App. D. C., 259), was decided in 1906. The defendant, a physician, devoted part of his time, without compensation, to the work of a free dispensary. The rules of the institution prohibited treating cases of contagious diseases at the dispensary. A child suffering from diphtheria was brought to him for treatment. He advised the child's mother to take her home and call a physician, but he did not report the case to the health officer.

The statute in force in the District of Columbia made it the "duty of every registered practicing physician * * * to make report to the health officer * * * of any case of scarlet fever or diphtheria in his charge * * *."

The court decided that the patient was not "in the charge" of the physician within the meaning of the statute. The chief justice in delivering the opinion of the court said:

Doubtless it would be a reasonable and beneficial exercise of the police power, in relation to the public health and safety, to require all physicians under whose observation a case of diphtheria or scarlet fever may come, whether they take charge of the same or not, to make immediate report thereof to the health officer in order that the necessary precautions may be taken to prevent contagion. But this statute has not so provided, and, however beneficial such result might be, it (the statute) can not be given a strained and artificial construction to accomplish the desired end.

In *Kansas City v. Baird* (92 Mo., App. 204 [1902]), the defendant was a Christian scientist and was charged with failing to report a case of diphtheria which she treated.

The ordinance under which the prosecution was brought provided that "Every physician who shall prescribe for or treat any case of * * * diphtheria * * * shall immediately on receiving knowledge that the person or persons are afflicted with any of the said diseases report same to the board of health."

The court held that a Christian science demonstrator was not a "physician" within the meaning of the ordinance, and further that there was no proof that she knew that the child was afflicted with diphtheria.

REPORTING OF BIRTHS AND DEATHS.

The reporting of births and deaths is of interest in this connection because of the similarity in some respects of the statutes requiring the notification of diseases and those requiring the reporting of births and deaths. The legal principles involved are in many respects similar. A comparison of the cases of *State v. Boone*, *infra*, and *State v. Wordin*, *supra*, indicates that courts might make a distinc-

tion between the reporting of communicable diseases and the reporting of births and deaths, as in the Wordin case the court referred to the protection afforded to the public by morbidity reports, while in the case of *State v. Boone* the court apparently took the view that registration of births and deaths was principally valuable for statistical purposes.

The supreme court of Ohio in the case of *State v. Boone* (84 Ohio St., 346), decided in 1911, held that several sections of the vital statistics law of Ohio were unconstitutional and void.

The court (Davis, J.) said:

That the general grant in the constitution of the legislative power includes police power is conceded; and that the registration of births, deaths, marriages and the like may be included in a proper exercise of the police power is also conceded. But it is disputed that, while requiring the registration of such facts as may naturally and readily come to the knowledge of persons present at a birth, death or marriage, the state may compel such persons to inquire for, investigate, and report upon, certain collateral matters which may be interesting and of possible value to a bureau of statistics, and that too without substantial compensation. * * *

We need not inquire whether the State may not require a physician or midwife to report to the proper authority, for registration, the fact of a birth which has come under his or her observation—first, because it is conceded that it may do so, and, second, because it obviously has some relation to the public welfare and it can not be very burdensome to comply with such regulation; but this statute goes much further. It imposes upon the physician or midwife the duty of investigating and certifying as to certain facts which would not necessarily or naturally come within the knowledge of the attending physician or midwife. * * *

Since this decision was rendered the law providing for registration of births and deaths in Ohio has been amended. The revised sections were published in the Public Health Reports May 15, 1914, at page 1272.

In *Robinson v. Hamilton* (60 Iowa 134 [1882]) the court sustained the validity of a regulation of the board of health requiring physicians to report in case of death "the sex, nationality, place of birth, period of residence in this State, and the place and date of burial of the decedent, and the complications connected with the cause of death, and to report in each case of birth, 'the number of the child of the mother,' the nationality, place of birth, and age of each parent, the maiden name of the mother and her place of residence."

The defendant failed to make report in a number of cases, and was sued to recover a penalty of \$10 in each case.

The court said:

Under the statute brought in question the defendants may be required to report the information sought in the manner prescribed by the board of health.

The statute requires the collection of statistics pertaining to the population of the State, and the health of the people, which may impart information useful in the enactment of laws and valuable to science and the medical profession, to whom the people look for remedies for disease and for means tending to preserve health. The objects of the statute are within the authority of the State, and may be attained in the exercise of its police power. Similar objects are contemplated by statutes requiring a census to be periodically taken, the constitutionality of which we have never heard questioned.

We need not inquire whether the provisions of the statute are unjust and oppressive. These are matters for the consideration of the legislative department of the Government. We may observe that it is difficult to discover oppression or injustice in requiring the medical profession to make known to the world statistics which may promote, and are promoting, the public health.

One ground of the demurrer is that defendant under the statute is required to do that which is impossible for him to perform. The law requires of no man impossibilities. If the information sought from defendant could not have been obtained by him in the bona fide exercise of reasonable diligence, the law will not punish him for not imparting it. A physician should honestly endeavor to obtain and report all information required by the regulations of the statute and the board of health. This is his duty as a surgeon, and is imposed as an obligation by the ethics of the useful and honorable profession of which he is a member.

In the case of *Commonwealth v. McConnell* (116 Ky., 358), decided in 1903, the defendant, a physician, was charged with failure to keep a register and report births and deaths, as required by the law.

The constitutionality of the act was questioned "because it requires physicians to perform a service without compensation, and that the legislature had no power so to do." The court said:

The public is deeply interested in the subject of the proper registry of marriages, births, and deaths, and we have no doubt that under the police power of the Commonwealth the legislature has authority to require of the professional parties in charge the performance of the duty of returning to the county clerk's office proper certificates in relation thereto.

The case of *Department of Health of the City of New York v. Owen* (88 N. Y. Supp., 184) was decided in 1904. The question in the case was whether a physician who placed the usual notice of a birth in an envelope, properly addressed, and deposited it in a mail box had fully complied with the provisions of the charter of the city of New York requiring the reporting of births.

The charter made it the duty of physicians "to keep a register of the several births in which they have assisted professionally * * * and report the same within ten days to the department of health."

The court held that the mailing of the report was a compliance with the statute, although it was never received by the department of health.

The defendant in the case of the Department of Health of the City of New York *v. Dunn* (129 N. Y. Supp., 29 [1911] was stated by the court to be a well-known and reputable physician. He was charged with failure to file a certificate of birth within ten days, as required by the law. The case was that of a child which lived but a short time. The defendant filed a certificate of death, which gave the date of birth, but he failed to file a certificate of birth.

The court decided against the defendant. The law not having been complied with, the court had no power to excuse the offense. — Reprint *Public Health Reports*.

THE LESSONS FROM A SMALLPOX EPIDEMIC.*

CHARLES A. LAMONT, A. B., M. D.,
Health Officer, Canton, Ohio.

At the time this subject was chosen for a paper I was consumed with the optimism of a novice to believe that when the time arrived for reading the paper the epidemic would be a matter of history. On the contrary, when I left Canton yesterday we still had thirty cases in quarantine, so our epidemic I regret to say is still a subject in current events.

The subject I will consider under the following heads:

1. History and progress of the epidemic.
2. Measures to control its spread.
3. Difficulties in control.
4. Mistaken policies.

While the first cases of this epidemic were reported September 29, 1914, yet the disease was epidemic in Canton all last year as follows:

January, 1 case; February, 3; March, 6; April, 5; May, 16; June, 17; July, 4; August, 2; a total of 54. At the time the writer became health officer August 15, 1914, there was one home in quarantine.

The next date the disease was brought to our attention was, as stated above, on September 29, when two cases were reported, a fe-

* Read before Conference of Health Officers.

male adult from the southeast part of the city, and an adult male from the southwest part. Cases 3 and 4, reported October 5, were from the northwest part of the city, adult males. Cases 5, 6, 7, and 8 were reported October 6. Case 5, was a maid at a hospital in the extreme west end of the city. Case 6, was an adult male, a railroad clerk from the notheast end; case 7, a bartender in the east end; case 8, an office man in the extreme north end.

The first eight cases, therefore, coming within one week, all unacquainted, living in different sections of the town, no two employed in the same institution, could not have been exposed to the same or even two or three missed cases.

The next report was October 13, when three new cases developed, two of which belonged to the family of case 1. Incidentally we traced twelve subsequent cases to case 1. On October 17, the real epidemic appeared, ten cases being reported in that week. This was followed by a pause until October 29, eleven days later, since when, until the end of the year, we have not had a longer interval than two days without a report of cases.

Our heaviest week was November 15-22, when forty-five cases were reported; the lightest was the week of December 20, when four new cases were reported.

The largest number under quarantine at any one time was seventy-one on November 28. The age of the patients varied from 8 months to 84 years. Thirteen cases were under 5 years of age. Fifty-two were in the public schools, 20 of which were in the West North grade school.

The progress of the epidemic is best shown by the two tables, one showing the number under quarantine each day since September 29, the other showing the daily number of new cases.

The rate gradually decreased from November 28 until December 27, when we experienced a new discouraging increase, sixteen new cases being uncovered that week, ten or twelve from an entirely new quarter and it was absolutely impossible to trace the source of the infection.

WEST NORTH SCHOOL.

I have already stated that there were twenty cases in this school. November 2nd, on an investigation, two cases of supposed chickenpox in this school turned out to be smallpox. From November 12th to November 21st, sixteen cases were reported from this school. An interesting feature is that in five of these cases other members of the family fell ill of the disease at the same time, indicating other sources

than at school. On November 28th, two more cases were the last evidence of infection from this source.

Cost of the epidemic to December 31st, was as follows:

Medical Supplies	\$519 51
Guards and Nurse Hire.....	898 00
Food Supplies	2,108 20
Coal	133 25
Miscellaneous	850 18
Unpaid Bills	548 78
Total	\$5,057 92

SPECIAL MEASURES ADOPTED TO CONTROL THE EPIDEMIC.

The following officials were connected with the department as far as it was concerned with the disease:

A part-time health officer, a part-time smallpox physician who makes the diagnosis and treats the cases, a full-time clerk who manages the office and keeps the records, and two full-time sanitary officers who place the quarantine cards, investigate, fumigate, etc.

A building for a retention hospital had been purchased in the summer and the remodeling was completed the latter part of September, just in time to receive the first patients of the epidemic. Its maximum capacity is about twenty-five patients.

The latter part of October it became painfully apparent that, in spite of our quarantine regulations, more active steps must be taken to control the spread of the disease. On November 1st, it was reported that several children of one family had been having for the past week a pustular eruption while attending the West North School. An investigation determined the condition as smallpox. The family physician had diagnosed the condition as chickenpox and when asked why it had not been reported, even as such, replied that he did not know that he was expected to report chickenpox. This answer, in spite of repeated notices to the physicians and through the press concerning reportable diseases.

On November 2d, at a special meeting of the Board of Health, the Health Officer presented the following recommendations:

In view of the increasing prevalence of smallpox in Canton;

In view of the widespread distribution of the disease;

In view of the existence of an absolute preventive against the disease;

In view of the large number of unprotected in the city against the disease;

It is recommended that the Board of Health strongly advise the immediate vaccination of all the unprotected; that is, all who have not been successfully vaccinated in the last seven years or who have never had smallpox.

This recommendation was published in the daily press. On the same day a summary of the public schools showed that among 8,000 school children but 1,700 had ever been vaccinated and but 200 of these in the last seven years.

The following day the Board of Health instructed the Health Officer and Mayor to appear before the Board of Education to explain the smallpox situation and ask their co-operation. At this meeting it was decided:

1st. To require all teachers to report all suspicious cases and strongly impress upon the pupils the urgent need of immediate vaccination.

2d. To make vaccination compulsory for all pupils hereafter admitted to schools.

The mills, stores and factories were notified of the situation and requested to post notices urging vaccination.

On November 3d, the following letter was sent to the Chamber of Commerce:

In view of the increasing prevalence of smallpox in our city;

In view of the odium attending an epidemic of such nature, and demoralizing effect on business;

In view of the presence of an absolute preventive against the disease, viz. vaccination;

The Health Officer respectfully solicits the support of the Chamber of Commerce in strongly advising universal vaccination of the unprotected in order to check and eradicate the epidemic now existing in Canton.

During the following two weeks every effort was made to push vaccination. The school principals, parent teachers association and ministerial association were addressed requesting co-operation. Smallpox literature from the State Board of Health was spread broadcast.

On November 9th chickenpox was made a quarantinable disease.

On the week of November 16th, thirty-eight physicians volunteered their services for gratuitous vaccination in the schools.

The same week the Board of Health recommended that the Board of Education take action to secure compulsory vaccination of school children. The subject was referred to the City Solicitor who gave the opinion that the compulsory education law could not be enforced if compulsory vaccination was adopted.

On November 19th, the two city physicians volunteered their services in the epidemic and the following day two more physicians were secured to devote part of their time. These four additional physicians investigated all suspicious cases, determined exposures,

and vaccinated or quarantined exposures. A special "exposure card" had been printed for this purpose and we had but one exposure who stood the exposure card for seventeen days, rather than submit to vaccination.

On November 25th, the following letter was mailed to 500 employers of the city:

On account of the increasing prevalence of smallpox in Canton, the Board of Health deems it necessary to inform you that in the event of one of your employees developing a case of smallpox at your institution, the remaining employees will be considered as exposed to the disease and will be quarantined until successfully vaccinated, unless already protected against the disease.

Unless we secure co-operation among employers in reporting the names of those refusing to be vaccinated, we will be compelled to quarantine the mill, factory, store or institution where smallpox develops.

I also desire to take this opportunity to urge all not protected to be vaccinated at once.

BOARD OF HEALTH,

CHARLES A. LA MONT,
Health Officer.

N. B. PLEASE POST CONSPICUOUSLY.

The majority of the employers to whom this letter was addressed, immediately made vaccination compulsory among their employees.

By a survey of the druggists of the city and by letters to all vaccine manufacturers as a check, I estimate that there were about 20,000 persons vaccinated in Canton from October 15th, to December 31st.

DIFFICULTIES IN CONTROL.

1. An unvaccinated community, therefore, a fertile field for an epidemic. The percentage of the school children, showing but 200 out of 8,000 properly protected, would, I believe hold good for the rest of the city.

2. Mildness of the epidemic. I feel I can safely say that this is the prime difficulty. The initial history of our cases is so uniform that it may be stated briefly as follows:

The patient is seized with a violent headache, backache, fever and occasionally vomiting and sore throat. A physician is called who diagnoses the case as grippe and sometimes incidentally mentions the possibility of smallpox. These symptoms after persisting twenty-four to forty-eight hours abate and the patient often returns to work. On the fourth or fifth day this eruption appears and no constitutional symptoms follow the initial onset, the patient feeling perfectly well. The point I wish to emphasize is that during the eruptive state of the

disease there is an absence of subjective symptoms, the patient is otherwise in good health and is usually found following the regular routine of work, thus exposing every one with whom he comes in contact, at his place of work, on street cars, in churches, theaters, saloons, etc.

3. The concealed and missed cases. This difficulty runs a close second to the one just discussed. On account of the mild attacks, in the 180 or 190 the death rate has been 0, people have no fear of the outcome and frequently every means is taken to avoid detection. Since a physician in these cases is not called after the initial attack unless an interested neighbor calls up our department the case goes on unreported.

A milkman reported to me the existence of eruption in a family on his route. Investigations showed five members of the family in the eruptive stage of smallpox with one member practically through the desquamative stage who all through the eruptive stage worked in a meat-market. It was also found that one of the proprietors of the meat-market was at home in the eruptive stage of the disease, unreported and sending his two children to school.

Our first eight cases, as a matter of fact, must have followed clandestine cases.

As late as January 9th, the health officer of an adjoining township reported the discovery of the fact, that smallpox had existed for the past six weeks in the family of one of our city milk producers, residing in his township. While none of our cases have been traced to this source yet other producers not only of milk but of other commodities may have successfully escaped detection.

4. Negligence and carelessness of physicians.

This was a difficulty at the beginning of the epidemic, more than at present, as for example the two cases in the West North school diagnosed as chickenpox. There is no doubt that those two cases were mainly responsible for the majority of the other cases in that school.

One more example may be cited under this head. The young man referred to above who worked in the meat-market through the eruptive stage twice consulted a physician who treated him for acne.

As a rule, however, we were fortunate to have the co-operation of the medical profession, as is evidenced by their gratuitous services in vaccinating the school children. There has been but one physician in Canton to my knowledge who has antagonized us. He claims that there has been no smallpox in Canton this year. It is all chickenpox or syphilis.

5. Internal dissension. At one time this all but crippled our organization and to a certain extent has impaired our efficiency throughout. At best such troubles are always decidedly unpleasant, especially since they seem so unnecessary. As these dissensions do not as a rule, I suppose, exist elsewhere, probably no more need be said.

6. Anti-vaccinationists. With these we have had very little trouble. There has been no organized opposition. The "conscientious objecters" have been very few as is evidenced by the fact that but one family allowed the "exposed card" to remain up more than eighteen hours before submitting to vaccination.

MISTAKEN POLICIES.

I shall follow scriptural teaching at least in this, that I will attempt to remove the beam first before removing the mote from my brother's eye.

1. Smallpox is the most easily preventable of all diseases. An epidemic of this kind, therefore, is a disgrace to a health officer, a board of health, and a community. The vaccination campaign should have started before the epidemic appeared. Canton, Sandusky and a few other cities are having their troubles now. You may be having yours soon.

2. The health officer should have assumed the responsibility of the epidemic with the first case, instead of after it had gone on for a month.

3. Vaccination should have been made universally compulsory instead of recommended and advised, no matter how strongly. It is doubtless true that such a procedure would have met with considerable opposition, but in my mind the sum total trouble would have been less and would have ended sooner.

4. It is probable that the closure of theaters and churches would have somewhat retarded the dissemination of the epidemic. As for the closure of the schools, in favor of which there was considerable pressure brought to bear, I strenuously oppose it in view of the fact that we have such an easy, harmless, effectual method of controlling the disease. I maintain this attitude for other communicable diseases as well.

5. Early in the Christmas shopping season the merchants brought pressure to bear to suppress all publicity concerning the epidemic. The wildest kind of rumorse, consequently, were current regarding the number of cases which the press of surrounding cities

did not fail to take advantage of. The number of cases should be announced daily and the exact location.

6. The Health Officer should be the executive officer of the Board of Health. By no other means can efficiency be obtained in public health work.

This account has not been given with the idea that this situation has been handled in a model or even an approvable manner. Many grave errors, not only of commission but omission were committed, a confession of which, however, may be of service to you in similar emergencies. Indeed I hope that our experience may serve as a warning to some of you who are connected with health departments in unvaccinated communities.

THE HEALTH DEPARTMENT UNDER THE COMMISSION-MANAGER FORM OF GOVERNMENT.

J. R. McDOWELL, M. D.,
Director of Health, Springfield, Ohio.

The operation of the Health Department under the commission-manager form of municipal government, it seemed to me, would be of interest to all, owing to the attention given it all over the country. Several cities in Ohio have either adopted this form or have taken steps toward a change of government.

There are slight variations in the commission-manager plan, but all, in principle, are the same, and I will take up the form with which I am most familiar and the one now operating in Springfield since January 1, 1914. The principle is the one adopted by all large business concerns, i. e., of a legislative or advisory board under which is an expert executive manager. Our own commission is composed of five men, elected at large, on a non-partisan ballot and prohibited from any campaigning or spending any money on their election. Two were elected for two years, and three for four years, then an election follows every two years, at one time electing two and at the next, three, and so on. This commission is the legislative body for the city, passing all ordinances and issuing all bonds. They, in turn, appoint a City Manager who is the executive head of the city and also the head of each department. He has the power of appointing all the employees and the heads of all departments, with the exception of the City Treasurer, Auditor and Solicitor, who are appointed by the commission. The heads of departments are appointed for no specified

time, and hold positions only on their merits. There are no political appointments and politics is absolutely tabooed in the city hall. How long it may remain so, time will tell, but the main point gained in such an administration is the opportunity for efficiency and the fixing of responsibility for each department, as the head of each is directly responsible to the Manager for every act or policy of the whole department. The Manager is responsible to the Commission, against whom the Referendum and Recall are available at any time after six months following election.

Having given you a general outline of this form of government, let us see how such a form affects the Health Department as to operation.

In the first place the Board of Health is abolished and all responsibility placed in one man, the Director, Commissioner, or whatever he may be called — in our city, the Director. Here in my estimation, is removed one great stumbling-block in the way of efficiency in health administration; for, with all due respect to our honorable boards of health and the excellent personnel of many of them, they are far too often composed of "dyed-in-the-wool" politicians and the appointments are good "political plums" handed out with a string tied to them.

Recently, as you know, in one of our own cities a member of the Board of Health, not a physician, undertook to show his authority by placing a quarantine card on a house, contrary to the orders of the Health Officer. Such a situation could not have occurred under the Commission-Manager form of government. The power of the health officer was weakened in the eyes of many of the citizens of that city, at a time when, above all others, authority and responsibility should have centered in one competent man.

Granted a Board of Health composed of well qualified physicians, — which is a condition, to my knowledge not existing in any city, — where would you find five physicians who would be able to agree on a policy and, under existing laws, not interfere with the administration of the department by the health officer?

Next in the line of stumbling blocks comes the city council. How many of you, even with the aid of your excellent Board of Health which you may have won over to your policy, have mapped out a campaign along some line, only to be stranded high and dry by an ignorant and stubborn council, which failed to appropriate the funds.

Our system of arranging yearly appropriations appears to me to be as fair and as nearly arriving at a just apportionment as possible. In October of each year the head of each department goes over his

requisitions and expenditures for the past year and from these makes his requests for the following year, together with what additions he may desire. These budgets are presented to the City Manager and a conference held between the Manager and the heads of departments. The Auditor presents to the Manager the appropriations and expenditures of each department for two years previous, also for the current year, and an estimate of all the possible income for the next year. The Manager presents to the Commission this complete array of data on a printed form, together with his recommendations for each department. From this, a fair distribution of funds is easily and promptly arrived at by the Commission. Appropriations and ordinances for additions to the department and extra expenditures are presented direct to the Commission—through the City Manager—by the head of the department. He has the privilege of meeting with the Commission and presenting his cause and showing them the necessity of a certain ordinance or appropriation, without having to win over a Board of Health. Again, five clear minded business men, such as compose our Commission, elected because of the efficient management of their own business, constitute a much fairer-minded body to whom to present any proposition, than the average Council, elected on a partisan ballot and bound by political ties to certain policies.

One great item of economy in our form of government is the making of all purchases through the purchasing agent. The department handles no funds itself. All requisitions must be O. K'd by the head of the department, the City Manager and the Auditor and an order issued by the Auditor. Requisitions are made according to a card code of accounts, a copy of which I have here. All appropriations are made according to this code, so that we know at all times just what we have available in each fund. No accounts need be kept in any department under this plan. Through an excellent system of double entry book-keeping, the Auditor can tell at a glance just what has been spent from each fund and the amount still available. The merchants soon become accustomed to this and will not deliver goods unless the order from the auditor is presented.

Each member of the department is on the full time basis and is not allowed to have any side issues or do any work except for the city. Herein lies the greatest step toward efficiency in any health department. The full time health officer is not handicapped by personal interest in his patients and kept from rigidly enforcing his regulations and orders for fear of losing some good family. To him all physicians are on an equal footing and he is bound by no personal or pecuniary

ties to any physician or set of physicians, which so often obtains, where the health officer is dependent upon his own practice to make a living.

But the greatest advantage, and the one which makes most toward efficiency, is the incentive to prepare and equip himself for his work. His reading and study can all be centered upon the different branches of public health work.

The salaries paid at present are not what could be wished, but the time is coming and is not far distant, when municipalities will demand the best and will be willing to pay for it. The courses offered by several schools, conferring the degree of Doctor of Public Health, will soon put men in the field who will be able to demand what is right and just for their services. Also, the people will realize that public health is one of the greatest assets which any community can possess and that it can be bought.

Now having gone over in a general way what appear to me to be the advantages to the Health Department in this form of government, let us take up just for a few moments, the organization and personnel of our Health Department in Springfield. Not that we feel that we have a model department, but that we have the nucleus of what, if carried out as planned, will prove a fair working model and a very wieldy organization for a city of our size, and even for one much smaller. We are still handicapped for funds and many of our desires have not been accomplished, but under our present administration, we feel that prospects for a model department on a small scale are very promising.

You will hear from Dr. Light of Dayton, in the discussion of this paper, what can be done under this form of administration on a larger scale. They have had the funds available to put their department on a basis of more than ordinary efficiency. In no city in the country have greater results been obtained in public health work in the last year, and in the reorganization of a Health Department and placing it on a systematic and at the same time wieldy and efficient basis, than in our neighboring city of Dayton.

The personnel of our department, at present, consists of a Director of Health, Assistant Director, Clerk, Plumbing Inspector, Public Health Nurse, and a Ford. Within thirty days we shall have added a Veterinarian Dairy and Food Inspector. The Board of Education are about to employ a school nurse, who will be under our control. A movement is now under way through private organization, to employ two more nurses, one for tuberculosis work and one for infant welfare, both to be placed under control of the Health Department and to be paid from the funds of the organization.

We have a municipal laboratory equipped for doing Diphtheria cultures, sputum examinations, and Widal's and where, this summer, routine water analyses as well as routine examination of milk, both chemical and bacteriological, will be made.

We have one free tuberculosis dispensary and close co-operation with a free dispensary in all branches at the City Hospital. We are also in close touch with the Associated Charities' Clearing House which at present, although not under municipal control, is housed in the city hall.

One division of our work of which we feel we have special reason to be proud, and one which could not be carried out satisfactorily under any other form of government, is our Sanitary Division. Our regular city patrolmen are doing all, or nearly all of our sanitary work. Only through the centralization of power in one executive could this be accomplished. All our orders are carried out as effectively as if in our own department through the city manager's office. Sanitary inspections are made, reports of which are signed by the officer, and these come direct to us through the manager's office. All complaints are investigated and notices served by the officers. In other words, the policeman is patrolling his beat not altogether on the front walk and on the street corner, but he is also patrolling the alley and the back yard and making himself more efficient not only as a guardian of the safety of the city, but as a guardian of the health as well. Having this connection with the Health Department has changed his attitude toward sanitary matters. He feels himself responsible for the sanitation of his beat and we are constantly having brought to our attention, by the police, conditions, which before they would have passed unnoticed. It is also surprising how the patrolman takes up this work after he has been taught something of the value of it. At first, short fifteen minute talks were given the men at roll call once a week, teaching them the value of sanitary inspection, what constituted a nuisance, and the reason for abating it going over the city ordinances and state statutes covering these nuisances, and answering questions which arose in their work.

I believe that the average patrolman is of just as high grade intelligence as the average sanitary patrolman and knows the conditions and the people of his beat much better. This new authority vested in him puts him on an entirely different plane with the citizen at large. Our mounted motor-cycle police card and release our quarantined houses and by this method we often have our houses carded in ten to fifteen minutes after the report of a contagious case.

We are more than pleased with first year's operations of this plan and heartily commend it to any city where the co-operation between the different departments is very close or where there is some centralization of power, as in the commission-manager form.

This brief outline, it is hoped, will at least furnish some material for discussion, and is offered not to convey the idea that we have a perfect organization or that we have reached to any extent a proper degree of efficiency, but with the idea of bringing before you what we believe, after practically one year's trial, a form of organization which furnishes possibilities of highest efficiency together with greatest simplicity of operation.

PLAGUE.

Its Geographic Distribution and Its Menace to the United States.

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Bubonic plague follows the main traveled roads, spreading out along the less beaten paths to the remote ends of the earth. Fortunately, its spread from one country to another occurs more frequently by water than by land.

The United States Hydrographic Office issues a large map called "Tracks for Full Powered Steam Vessels." It is a Mercator's projection of the world. If such a map be laid out on a flat surface and pins are inserted to mark the places in which bubonic plague prevails at the present time, not only will the geographic distribution of the disease be pictorially represented, but the fact of its spread along the routes of commerce will be shown as well. It will be noted in the first place that the continents are almost encircled by the pins which mark the places where plague exists, and at those points where the lines of travel converge, such as the Hawaiian Islands and Mauritius, the disease is almost sure to exist.

Rodent and human plague were found in the Hawaiian Islands no longer ago than August last. Taking the Hawaiian Islands as a central point, plague is found to exist in Seattle, 2,409 miles away; in California, 2,091 miles distant; in Yokohama, 3,445 miles away; in Hongkong, 4,857 miles away, and in Shanghai, a little over 5,000 miles distant. It is thus easily seen how our entire Pacific coast is threatened by plague from the Orient, with the Hawaiian Islands as the point at which the lines of travel converge and from which the disease routes spread out to our western ports.

The Pacific coast is also menaced by the existence of the disease in Ecuador and Peru, on the western coast of South America, a little over 4,000 miles away from San Francisco.

The entire Gulf coast of our country is menaced by plague in Habana, 769 miles from Galveston, 601 miles from New Orleans, 324 miles from Tampa, and 92 miles from Key West. The disease was found among rats in New Orleans no longer ago than March 9, 1915. On account of the unsettled conditions now existing in Mexico, it is impossible to know whether or not plague exists in her Gulf ports.

The Atlantic coast of the United States is threatened with the importation of plague not only from the eastern coast of South America but from European, African, and Asiatic ports as well. Less than 5,000 miles from New York, plague is found in Brazil, at Pernambuco, Bahia, and Rio de Janeiro. In the Mediterranean littoral, plague is found in Tripoli, Greece, Egypt, and at Port Said, one of the great gateways of the world. Practically all of the great ports of British India, with the exception of Calcutta, are infected with plague. Rangoon, Madras, Colombo, Bombay, and Karachi report the presence of the disease, and from the latter point it has extended up into the Persian Gulf. Singapore, Surabaya, Mauritius, Zanzibar, Queens-town in South Africa, and Dakar in Senegal, all have plague. Directly or indirectly our country is in commercial communication with all of the infected places which have been mentioned, and it must be admitted that in view of the fact that plague is a disease of rodents which travel around the world in ships, the United States must consider itself as seriously menaced by bubonic plague.

Under normal conditions plague is an epizootic disease of rodents. Occasionally, as favorable conditions arise, it becomes an epidemic disease. Among rodents it may be either acute or chronic. The former conditions produce a rapid local spread of the epizootic. The latter condition perpetuates it locally and permits its distribution to distant ports. Since the disease is capable of such perpetuation and since it is found in almost all of the great ports of the world, there is no reason to believe that it does not exist in the remaining ports, and that our lack of knowledge as to its existence in those ports from which it has not been reported, means that the search for the disease has either been neglected or has been made half-heartedly. This applies to the United States as well as to other countries. Careful rodent surveys have been conducted in only three of the ports of this country and in all three of these the disease has been found to exist. It is not at all unlikely that a thorough search would demonstrate the presence of the disease in the other American seaports having a large foreign commerce.

The experience at New Orleans is an ample demonstration of this assertion. Several thousand rats were examined before a single one was found which was plague infected, and this one would in all probability have been entirely overlooked had it not been for the large experience of the examiners. The examination of rats is a matter requiring considerable skill and much experience, and whenever there is a plague outbreak as many sanitary officers as possible should visit the scene and thoroughly familiarize themselves with the methods to be used in diagnosing, studying, and combating the disease. This was done at New Orleans, and representatives from many of the States found there an excellent opportunity to acquire knowledge of the disease at first hand.

Granted the existence of such a condition, What are the steps to be taken to combat it? The first line of defense is maritime quarantine. This may be so applied as to be exceedingly effective, but such efficiency is to be obtained only at the price of disastrous interference with commerce. The routine disinfection of ships, if done very thoroughly, will prevent the introduction of rats, and therefore the introduction of bubonic plague, but such a measure is of temporary value only, and if omitted a single time may be followed by the introduction of plague rats. In the case of vessels hailing from known plague ports such fumigation should not be omitted, and in the protection of ports which have not been rat proofed it is also necessary. To sum up, quarantine is absolutely effective only at the cost of commerce. It is at best a makeshift. Disinfection is expensive and not always certain.

The second line of defense is at the wharves and consists in the prevention of the embarkation or disembarkation of rodents. This is accomplished by the use of metal rat guards on all mooring lines; by breasting the vessel off from the wharf by rafts or spars; by the guarding of gang planks; and by the inspection of the freight to determine its rat-proof, rat-free condition prior to loading or unloading. The last is a valuable measure, but not one upon which absolute reliance can be placed.

The third line of defense may consist in the immunization of human beings against bubonic plague. This is at best a weak reed upon which to lean. In the absence of an epidemic it is manifestly impossible in American cities to enforce Haffkinization. Under the most favorable conditions only a small portion of the community would consent to voluntary immunization, and of those who took the treatment only a small proportion would be among the stevedore and waterfront class, the very people who are most liable to the disease at the beginning of the epidemic.

The fourth line of defense consists in rat proofing the environment in which man works and lives. All of the other lines of defense or any combination of them may be used, but the single one upon which absolute reliance can be placed and from which lasting protection may be obtained is by the insulation of man from the animal which serves as the disseminating host of bubonic plague. Any city which will render itself completely rat proof need have no fear whatsoever of plague. The introduction of plague rats into such a place will be an occurrence of no account, because if rats and therefore the insects which they harbor are excluded from close contact with man it is a matter of entire indifference to him whether the rats have plague or not. It is not infrequently urged that rat proofing is expensive. In the final analysis this is not true, and by reason of the more rapid and increased commercial communication which we have with all the rest of the world rat proofing has become as absolutely necessary as are good roads, sewers, and public water supplies.

No modern city can afford to regard rat proofing as a luxury. It is the duty of every municipality to incorporate in its public-health and building codes ordinances requiring the rat proofing of all structures within the limits of its jurisdiction. If the passage of such legislation is put off until an epidemic has appeared the work must be done under pressure. It is then relatively expensive. If the work is done gradually, particularly if it is done at the time the building is erected, the cost is comparatively trifling.

The only kind of rat proofing which is really worth while is by the use of permanent impervious material, such as brick, concrete, or stone. This will fortify the ground areas against the entrance of the Norway rat. In the installation of such rat proofing great care is necessary that all accidental openings, such as are found around plumbing, electric wiring, and the like, be closed effectively. All openings above the ground area should be closed with metal screening so that the climbing rats may not enter in this way. Those who live or work in rat-proof premises need have no fear of plague, and the city which is rat proof will not become the scene of an epidemic of the disease.

The eradication of plague from the city of New Orleans has already cost the Nation, the State, and the municipality upward of \$400,000, exclusive of the large sums of money which corporations and private individuals have laid out in rat proofing. The \$400,000 expended for epidemic measures would have gone a long way toward building permanent fortifications against rats. In additions, it should be pointed out that the business losses which the presence of an epidemic produces are so great as to be almost beyond computation.

So much has been written and said elsewhere regarding the methods to be used in plague eradication and prevention that it is needless to review that phase of the subject here. We know that plague is widely distributed over the inhabited portions of the globe. We know that our country is in constant communication with the various foci of the disease. We know that the most perfect quarantine system which it is capable for the mind of man to devise cannot absolutely exclude the disease without serious impairment of commerce. We know that by the foresighted application of the simple principles which have been worked out by Surg. Gen. Rupert Blue and his co-workers plague may be eradicated or prevented. The remedy, then, is simple. It lies in our power to say whether or not our country shall suffer sorrow and bereavement and financial losses by reason of our failure to make use of well-proven measures. The day is fast approaching when the spread of this knowledge will have been such that public opinion will brand as ignorant or careless, communities which fail to erect those barriers which will banish rodents from the home of man. In the older countries it is more difficult by reason of structural conditions to put plague-preventive measures into operation, but in a new country like ours, which is still in the era of building, the erection and maintenance of nonrat-proof structures is inexcusable. Our duty as the wardens of the public health is to disseminate the information that plague is a wholly and entirely preventable disease, having no place in modern civilization and enlightened communities.

A SURVEY OF INDUSTRIAL HEALTH-HAZARDS AND OCCUPATIONAL DISEASES IN OHIO.

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(Continued from the June issue.)

IRON AND STEEL DOORS AND SHUTTERS.

The Census gives 3 establishments, without stating the number of wage-earners. Our investigations covered 1 establishment, in 1 city, employing 90 wage-earners, all males. The chief processes of health-hazardous character were found to be: Machine Shopping and Painting.

JEWELRY.

The Census gives 35 establishments, employing a total of 356 wage-earners. Our investigations covered 3 establishments, in 1 city,

employing a total of 23 wage-earners, all males. Apparently there is no diamond cutting as a regular process done in this state, hence the dangers of lead poisoning and dust from this source may be considered almost nil. One health-hazardous process is Soldering, in which the worker has his face very close to the fumes which arise, and another is the inhalation of metallic dusts from Polishing and Buffing. At two of the places inspected good exhaust systems were present. Another hazard is fatigue, due to eye-strain, monotony, faulty postures, blow-piping, etc. There is also Engraving, Etching and Electroplating. There is some risk from lead fumes, cyanid fumes from hot baths, mercury vapor and acid fumes, as well as shellacs, which are used. No cases of eczema or skin trouble were found.

JUNK.

(Sorting Rags and Scrap Metals.)

The Census gives no figures for this non-manufacturing industry. Our investigations covered 22 establishments, in 4 cities, employing a total of 406 wage-earners, of whom 334 were males and 72 were females. These figures do not include those engaged in sorting and handling of rags in paper-stock companies. The chief health-hazardous processes were found to be: Junk Sorting, and occasionally melting down of non-ferrous metals. (See Brass Foundry; also Paper Manufacturing.)

LEAD.—BAR, PIPE AND SHEET.

The Census gives 2 establishments engaged in this industry, but the number of wage-earners is not stated. Our investigations covered 3 establishments, in 2 cities, employing a total of 34 wage-earners, all males. This does not include establishments considered as lead oxide manufacturing (see Paint Manufacturing). The chief health-hazard is the handling, melting and pouring of lead—in other words, Foundry. (See Foundry, Brass.) In one plant efficient hoods and ventilating stacks were provided. In the other 2 these were absent. There was a general ignorance of personal hygiene respecting lead poisoning, and the workers were allowed to eat anywhere. Washing facilities were very inadequate. One lead poisoned worker was seen in one of the places.

LEATHER.—TANNED, CURED AND FINISHED.

The Census gives 36 establishments, employing 1,884 wage-earners, or 0.4% of the total wage-earners in the state. Our investigations covered 8 establishments, in 4 cities, employing 1,120 wage-

earners, all males. The chief processes of health-hazardous character were found to be: Leather Handling, Leather Dyeing and Leather Chemical Processes.

LIME.

The Census gives 39 establishments engaged in this industry, employing a total of 1,273 wage-earners, or about 0.3% of the total wage-earners in the state. Our investigations covered 7 establishments, in 6 cities, employing 556 wage-earners.

The process is considered under the head of Lime Burning. There is also Quarrying and Gas Producing.

MATCHES.

The Census gives 4 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 3 establishments, in 3 cities, employing a total of 1,782 wage-earners, of whom 1,313 were males and 469 were females. The chief processes of health-hazardous character are given under Matches (Part V.) (Most of the workers are in General Factory Processes.)

MIRRORS.

The Census gives 8 establishments, employing 94 wage-earners. Our investigations covered 5 establishments, in 3 cities, employing a total of 89 wage-earners, all males (these are in addition to Mirror Making done by firms in the art glass business). The chief processes of health-hazardous character were found to be: Mirror Making (Silvering), Glass Finishing, and Polishing and Buffing.

MUSICAL INSTRUMENTS, PIANOS, ORGANS AND MATERIALS.

The Census gives 30 establishments engaged in this industry, employing 1,841 wage-earners, or 0.4% of the total wage-earners in the state. Our investigations covered 5 establishments, in 3 cities, employing a total of 851 wage-earners, of whom 4 were females. The chief processes of health-hazardous character were: Brass Founding, Iron Founding, Core Making, Metal Grinding, Tumbling, Polishing and Buffing, Furnacing, Machine Shopping, Soldering (also Welding, Brazing), Acid Dipping, Electroplating, Wood-working, Gluing, Painting and Varnishing, Shellacing and Lacquering, Japanning and Bronzing.

OILCLOTH AND LINOLEUM.

The Census gives 3 establishments, but the number of wage-earners is not stated. Our investigations covered 3 establishments, in 3

cities, employing a total of 240 wage-earners, all males. The chief processes of health-hazardous character were found to be: Oil Cloth and Linoleum Manufacturing, Oil Refining, Printing and Dyeing.

OIL (LINSEED) AND PETROLEUM REFINING.

The Census gives 14 establishments, employing 1,872 wage-earners, or about 0.5% of the total wage-earners in the state. Our investigations covered 5 establishments, in 3 cities, employing 1,007 wage-earners, all males. The chief processes of health-hazardous character were found to be: Oil Refining, Lead Burning (Soldering), Machine Shopping and Wood-working.

PAINT AND VARNISH.

The Census gives 87 establishments, employing 1,535 wage-earners, or 0.3% of the total wage-earners in the state. Our investigations covered 40 establishments, in 6 cities, employing a total of 2,379 wage-earners, of whom 2,041 were males and 338 were females. The chief processes of health-hazardous character were found to be: Manufacturing Lead Compounds, Paint and Varnish, Filling Paint and Varnish Containers, and Labeling; also Founding (See Brass), manufacturing Tin Cans and Soldering.

PATENT MEDICINES AND COMPOUNDS, AND DRUGGISTS' PREPARATIONS.

The Census gives 261 establishments engaged in this industry, employing 905 wage-earners, or 0.2% of the total wage-earners in the state. It will be observed that the average number of wage-earners per each establishment is very low. Our investigations covered 1 establishment, employing 95 wage-earners, of whom 47 were males and 48 were females. Health-hazards in this industry are chiefly those of Factory Processes in General. See also Mixing Chemicals.

PHOTO-ENGRAVING.

The Census gives 20 establishments, employing 277 wage-earners. Our investigations covered 2 establishments, in 4 cities, employing 36 wage-earners, all males, in addition to those in conjunction with printing and publishing establishments. The principal health-hazards were found to be: Art and Designing, Photography, Copper and Zinc Printing and Etching, and Blocking. (Photo-engraving has been considered under Printing—Art, Half-tone, Etching, etc.)

PORCELAIN ENAMELED IRON WARE.

The Census does not give this industry by itself, but probably includes it in Foundry and Machine Shop Products. Our investigations covered 5 establishments, in 3 cities, employing a total of 504 wage-earners, all males. The chief processes of health-hazardous character were found to be: Porcelain Enameling of Iron Ware, Brass Founding, Iron Founding, Core Making, Machine Shopping, Metal Grinding, Sandblasting, Wood-working, Painting and Varnishing.

POTTERY, TERRA COTTA AND FIRE CLAY PRODUCTS.

The Census gives 186 establishments, employing 16,519 wage-earners, or 3.7% of the total wage-earners in the state. Our investigations covered 56 establishments, in 16 cities, employing a total of 9,494 wage-earners, of whom 6,800 were males, and 2,694 were females. The branches of the industry investigated were:

	<i>No. of Potteries.</i>
(1) White, China and Sanitary Ware.....	34
(2) Yellow, Art and Utility Ware.....	8
(3) Stoneware	8
(4) Tiles (decorative)	4
(5) Porcelain (electrical)	2
Total	<hr/> 56

The principal processes of health-hazardous character in this industry were found to be: Slip Making, Glaze Making, Sagger Making, Mold Making, Clay-room Processes, Glaze Dipping, Biscuit and Glost Kilning, Biscuit and Glost Finishing, Decorating, Assorting (Shading), and Packing and Shipping.

According to the State Vital Statistics Reports, there were 225 deaths among male Potters in the state during the years 1910, 1911 and 1912, of whom 53, or 23.6% died of pulmonary tuberculosis. The rates for females in this industry are not given. It must also be borne in mind that this rate is conservative, since a certain percentage of consumptive potters leave the state and die elsewhere, or leave the industry and take up other callings before death ensues. This rate is to be compared to the pulmonary tuberculosis death rate of all occupations in the state combined, for the same years, which was 13.3%; and is also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

PRINTING AND PUBLISHING.

The Census gives 1,655 establishments, employing 15,756 wage-earners, or 3.5% of the total wage-earners in the state. Our investigations covered 34 establishments, in 5 cities, employing a total of 2,725 wage-earners, of whom 2,325 were males and 390 were females. The principal processes of health-hazardous character were found to be: Composition and Miscellaneous Small Work, Type-Machine Processes, Printing Press Processes, Bookbinding, Artistic Work, Half-tones, Etchings, etc., Lithographing, Compounding Chemicals, Gluing, Founding (Brass). No type-founding of consequence appears to be done in the State of Ohio.

According to the Vital Statistics Reports for the State of Ohio, for the years 1910, 1911 and 1912, there were a total of 273 deaths reported among Printers, Pressmen and Compositors, of whom 58 died of pulmonary tuberculosis, or 21.25%. This rate is to be compared to the pulmonary tuberculosis death rate of all occupations in the state combined, for the same years, which was 13.3%; and is also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

ROOFING MATERIALS.

The Census gives 11 establishments, but the number of wage-earners is not stated. Our investigators covered 3 establishments, in 3 cities, employing a total of 141 wage-earners, of whom 135 were males and 6 were females. The roofing materials in question consisted of the various types of roofing paper. The chief processes of health-hazardous character were found to be: Rag-Sorting and Handling, Paper Manufacturing, Machine Shopping, and Mixing Chemicals.

RUBBER GOODS.

(Not elsewhere specified.)

The Census gives 37 establishments, employing 10,382 wage-earners, or 2.4% of the total wage-earners in the state. Our investigations covered 32 establishments, in 14 cities, employing a total of 25,060 wage-earners, of whom 22,173 were males and 2,887 were females. Two or three of the large companies had sick benefit associations among the employes, but only a portion of the latter were members. There were no unions. The attitude toward employes was usually very good, while all the larger companies maintained welfare and efficiency departments. No organized instructions along health lines were given to employes, nor were placards, other than "Don't Spit" signs, observed.

The chief poisons used in the industry were in the order of their danger to users: Anilin oil, carbon bisulphide, benzol (benzene), lead compounds, antimony compounds, mineral acids, alkalis, benzine (naphtha, petrol, gasoline), wood alcohol, sulphur chloride, carbon tetrachloride, mercuric sulphide, and turpentine; in some processes there were also the risks of leaks from illuminating and fuel gas. A considerable part of the work was done on the two or three shift plan extending over the 24 hours. The chief processes of health-hazardous character were found to be: Rubber Washing, Compounding, Mixing Mills, Calendering (including Warming Mills), Tire Building, Pit Curing, Hot-Press Curing, Dipping, Cold Curing, Vapor Curing, Making Inner Tubes, Buffing, Reclaiming, Cement Mixing, Specialty Manufacturing. In addition, there were the following processes of health-hazardous character: Forging and Blacksmithing, Machine Shopping, Wood-working, and Mixing Chemicals, while the vast lot of workers were engaged in General Factory Processes.

According to the Vital Statistics Reports for the State of Ohio, for the years 1910, 1911 and 1912, there were 118 deaths among Rubber Factory Operatives (males), of whom 23 died of pulmonary tuberculosis, or 19.49% of their deaths. This rate is to be compared to the pulmonary tuberculosis death rate of all occupations in the state combined, for the same years, which was 13.3%; and is also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%. (See also Special Health Report of a Rubber Company, Part IV.)

SAFES AND VAULTS.

The Census gives 10 establishments, employing 2,014 wage-earners, or 0.5% of the total wage-earners in the state. Our investigations covered 4 establishments, in 3 cities, employing a total of 1,074 wage-earners, all males. In one other plant the painting department alone was visited, employing 68 men at this work. This does not include establishments investigated, which were also engaged in the manufacture of stoves. The chief health-hazards of this industry were found to be: Iron Founding, Metal Grinding, Machine Shopping, Polishing and Buffing, Welding, Electroplating, Sandblasting, Painting and Varnishing, and Enameling.

SALT.

The Census gives 8 establishments engaged in this industry, employing a total of 648 wage-earners. Our investigations covered 1 establishment, in 1 city, employing 150 wage-earners, of whom 135

were males and 15 were females. The chief processes of health-hazardous character were found to be: Salt Manufacturing and Coop-erage (Wood-working).

SCALES AND BALANCES.

The Census gives 6 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 3 establishments, in 3 cities, employing a total of 700 wage-earners, of whom 650 were males and 50 were females. The chief processes of health-hazardous character were found to be: Forging and Blacksmithing, Metal Grinding, Polishing and Buffing, Machine Shopping, Tempering, Acid Dipping, Electroplating, Wood-working, Painting and Varnishing, Shellacing and Lacquering.

SHIPBUILDING, INCLUDING BOAT BUILDING.

The Census gives 39 establishments engaged in this industry, employing a total of 3,200 wage-earners, or 0.8% of the total wage-earners in the state. Our investigations covered 3 establishments, in 2 cities, employing a total of 1,480 wage-earners, all males. The chief processes of health-hazardous character in this industry were found to be: Iron Founding, Forging and Blacksmithing, Machine Shopping, Soldering, Wood-working, Painting and Varnishing (Caulking), Shellacing.

SIGNS AND ADVERTISING NOVELTIES.

The Census gives 28 establishments engaged in this industry, employing 1,096 wage-earners, or 0.2% of the total wage-earners in the state. Our investigations covered 12 establishments, in 4 cities, employing a total of 1,043 wage-earners, of whom 790 were males and 253 were females. The chief processes of health-hazardous character were found to be: Machine Shopping, Soldering, Furnacing (Kilning), Acid Dipping, Electroplating, Mixing Chemicals, Printing Processes, Lithographing, Artist's Work, Painting and Varnishing, Enameling, Paint Mixing, Bronzing, Wood-working, and Factory Processes such as Leather Skiving, Celluloid Finishing, Assembling, etc.

SMELTING AND REFINING.

(Not from the Ore.)

The Census gives 6 establishments, employing 57 wage-earners. Our investigations covered 4 establishments, in 2 cities, employing 45 wage-earners, all males. The chief processes of health-hazardous character were found to be: Junk Sorting and Handling, Soft Metal Melting (see Founding, Brass).

SPRINGS.—STEEL CAR AND CARRIAGE.

The Census gives 5 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 6 establishments, in 4 cities, employing a total of 653 wage-earners, all males. The chief processes of health-hazardous character were found to be: Furnacing, Hot Rolling, Forging and Blacksmithing. Machine Shopping, Metal Grinding, Tempering, Electroplating, and Tool Making (see Cutlery and Tools).

STEREOTYPING AND ELECTROTYPING.

The Census gives 14 establishments engaged in this industry, employing a total of 207 wage-earners. Our investigations covered 6 establishments, in 3 cities, employing a total of 229 wage-earners, all males. The processes were also investigated in several printing establishments (see the various Printing Processes, especially Type Machine Work). The chief processes of health-hazardous character were found to be: Founding (Brass), Mixing Chemicals, and Electroplating. Some of these establishments were also engaged in the Printing Processes.

STOVES AND FURNACES.

The Census gives 102 establishments engaged in this industry, employing a total of 7,274 wage-earners, or 1.6% of the total wage-earners in the state. Our investigations covered 15 establishments, in 9 cities, engaged mostly in the manufacture of stoves rather than furnaces. The manufacture of safes was found to be an auxiliary feature with some of these companies. The total wage-earners in the plants covered by our investigations were 5,160, of whom 5,104 were males and 56 were females. The chief processes of health-hazardous character were found to be: Iron Founding, Core Making, Metal Grinding, Sandblasting, Tumbling, Polishing and Buffing, Machine Shopping, Welding, Soldering, Acid Dipping, Pickling, Electroplating, Enameling, Japanning, Painting and Varnishing, Wood-working.

TIN PLATE AND TERNE PLATE.

The Census gives 4 establishments engaged in this industry, employing a total of 676 wage-earners, or 0.2% of the total wage-earners in the state. Our investigations covered 5 establishments, in 5 cities, employing a total of 2,989 wage-earners, but of these only 616 were engaged in the tin and terne plate processes, including 74 females. (The balance are considered under Iron and Steel Rolling Mills.)

The chief processes of health-hazardous character were found to be: Pickling, Tinning, Machine Shopping, Forging and Blacksmithing, and Lacquering.

TOYS AND GAMES.

The Census gives 19 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 4 establishments, in 2 cities, employing a total of 625 wage-earners, of whom 569 were males and 56 were females. The chief processes of health-hazardous character were found to be: Metal Grinding, Machine Shopping, Welding, Tinning, Electroplating, Brazing, Enameling, Painting and Varnishing, Upholstering.

(To be continued.)

GENERAL PROCESSES.

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(Continued from the June issue.)

ENAMELING.

As commonly understood, an enamel is an air-drying or baking varnish to which color and opacity have been imparted by the addition of pigments (in some instances, also, of dyes). The process consists in applying enamel to steel, iron, soft metal alloys, wood, and glass in a moist or oil form with brushes, or by pouring, dipping, blowing, or spraying with compressed air, and in a dry form by sieving, dusting, or blowing the powdered enamel upon the ware. The objects are then dried and baked in a special oven, furnace or kiln to harden the enamel. Japanning was a frequently associated process. While in 3 of the places reported here, porcelain enameling of iron was done, this process itself is considered elsewhere.

Enameling was investigated in 25 establishments, in 8 cities, and employed a total of 716 wage-earners, of whom 377 were males, and 139 were females. The females were employed, chiefly, at spraying enamel. The following industries were included: Agricultural Implements, Automobiles, Bicycles and Sewing Machines, Brass and Bronze Products, Copper, Tin and Sheet Iron Goods, Cutlery and Tools, Electrical Apparatus, Enameling and Japanning, Foundry and Machine Shop Products, Furniture, Safes and Vaults, Signs and Advertising Novelties, Stoves and Furnaces, and Toys and Games.

In two or three small places very crude processes appeared to be used. There were no union organizations. The general interest of employers in the welfare of their workers was good in 19 places, fair in 5 more, and poor in 1 small place. An intelligent type of workers was employed in 16 places, fairly so in 7 more, and an ignorant class of foreigners in the remaining 2. Every

attempt seemed to be made to retain the employes in 19 places, fairly so in 4 more, while in the remaining 2, little attention appeared to be given to the personnel. Health appliances consisting of hoods and vents, or work within boxes for spraying, or respirators for sanding or brushing, as well as arrangements to protect against the heat from baking ovens, were present in 13 places, in 8 of which they appeared efficient, 4 fairly so, and 1, not so. In the remaining 12 they were absent. In 2 places, some instructions were given along the line of health conservation. In 1 place a sick benefit association existed. The work was very largely unskilled. Work quarters were hygienically constructed in 11 places, fairly so in 4 more, and not so in the remaining 10. Other processes were present in 8 places, such as the baking of the ware, japanning, decorating, electroplating, painting and factory processes. The age-group estimations summed up as follows: over 40 years, 28; under 40 years, 451, of whom about 5% were under 20 (mostly girls).

In 11 places *dust* appeared to be a negligible hazard; in 4 places there was a fair amount in the atmosphere, while in the remaining 10 it was bad. It consisted, variously, of lead compounds, fillers, sand, dried spray, and paint. It was chiefly produced by dry sanding. It was "kicked up" considerably from the floors. In many places no attempts whatever were made to control it, although here and there respirators were supplied. Especially in the dry grinding and mixing of enamels was it very dusty. Two places had these processes well hooded. Quarters were kept *clean* and orderly in 6 places, fairly so in 12 more, and not so in the remaining 7. This was especially hazardous where lead was a content of the enamels used. Dry sweeping and cleaning, sometimes during work hours, were also noted. In 3 places the work was of a *damp* character from water and sprays used, but the employes wore rubber boots, and were quite well protected. Natural *light* was very poor in 4 places. General room *ventilation* was good in 7 places, fair in 9, and poor in the remaining 9. The unhealthiness of the atmosphere was due chiefly to contamination with fumes and vapors, especially where ovens were in the same room, while stagnation of the air was a feature in several places. *Heat* was no factor in 18 places, but it was a fair hazard in the remaining 7, and especially so in 1, due to the close proximity of the baking oven. In some places *cold*, due to drafts, and having to go to outside closets or privies, and in 1 place, inefficient heating, was noted. *Fatigue* was a considerable hazard in some places and negligible in others, the former constituting, however, 16 of the total places investigated. The factors, arranged in descending order were: hurrying piece-work, constant standing (still), and, much less frequently, laborious work, long hours for the character of the work, jarring processes, pressure against the body, and loud noises. The workday was 8 hours in 2 places, 8 to 9 hours in 8 places, 9 to 10 hours in 14 places (and not reported upon in the remaining 1). The noon recess was 1 hour in 2 places, $\frac{3}{4}$ hour in 2 places, and $\frac{1}{2}$ hour in 21. The risk of contracting *communicable diseases* was determined as negligible in 2 places, a fair hazard in 13 more, and bad in the remaining 10. The principal reasons for this were promiscuous spitting upon dusty floors, absence of cuspidors, inadequate washing facilities, poor closets, the use of common drinking cups and towels, wiping rags (unsterilized) from unknown sources, while in some places frequent trivial injuries, flying particles, and the short-interval handling of objects by different workers were factors. Among the *poisons* used in the

industry, lead was not as frequently encountered as might be surmised. In only 5 places was it certainly used (red or white lead as a rule). The enamel in most places appeared to be of the newer preparations, characterized by quick drying, and free of lead. Other poisons necessarily present were turpentine and benzine (naphtha), while amyl acetate, pickling fumes, antimony (?), sulphur, smoke and gas fumes were all noted. The risk of poisoning from one or another of these appeared negligible in 4 places, a fair hazard in 9, and considerable in the remaining 12. A monthly medical examination was in vogue in 1 place. The methods of doing the work, in which a large amount of dust or nebulous spray was produced were important factors in poisoning. The industrial inducement to *stimulantism* was considered bad in 3 places, and fairly so in most of the remaining, due, chiefly, to the poison factor, after which the question of dust, poor ventilation and fatigue entered.

The general *appearance* of enamellers rated good in 11 places, fair in 12 more, and poor in the remaining 2, the latter including a total of 30 persons. In a number of instances, pale and anemic looking workers were seen. The health *complaints* of workers were the breathing of fumes, sprays and dust, the frequent failing of the special ventilation systems used, and subjective symptoms of the effects of the above hazards. In a number of places dizziness was a frequent complaint. Investigators reported the following instances of *occupational disease*: lead poisoning, 4 positive, and 1 tentative; dermatitis from naphtha, 1 positive; while there was considerable additional evidence of the effects of turpentine and benzine fumes, as well as further instances of lead poisoning.

Comments.—Where lead is used, a monthly examination of all exposed employes should be made by a physician. Installation of hoods and vents, or the performing of the work within enclosed cupboards or boxes, through which the hands may be inserted, and, where these are impractical, the insistence upon the wearing of respirators, and a frequent interchange of workers should be instituted. Every case of sickness among enamellers should be investigated by a factory physician, with a view to eliminating the cause (not the worker).

JAPANNING.

A japan is a lustre-giving substance containing resins or gum-resins, metallic salts, drying oils, and volatile liquids; or (decorative japan) asphaltum, etc., and lies between a spirit varnish and an enamel. Japanning is a process closely associated with enameling, the substances being applied in much the same way and baked.

The process was investigated in 10 establishments, in 6 cities, and employed a total of 146 wage-earners, 89 of whom were males and 57 were females. General working conditions, type of workers, retention, health appliances, construction or workrooms and the presence of other processes did not differ materially from those described under Enameling.

The following hazards were considered bad in the number of places mentioned: *dust*, 1; *dirt* and *disorderliness*, 2; *darkness*, 1; *poor ventilation*, 3 (and in 5 others only fair); *heat*, 1; *fatigue*, 5 (due to hurrying piece-work, constant standing and monotony); liability to *communicable diseases*, 6 (the same factors as under Enameling); and industrial inducement to *stimulantism*, a fair extent in most places.

Age-group estimations showed 36 over 40, and 5 under 20, the remaining 105 being between 20 and 40 years. The *poisons* used in the process, so far as could be learned, were turpentine, benzine (naphtha), "japan," and bronze. There were in places also the escape of gas fumes from the baking ovens. The liability to poisoning was considered negligible in 2 places, fairly so in 5 more, but considerable in the remaining 3. In places the workers dipped their arms up to the elbows in the solutions.

The general appearance of workers averaged good in 6 places and fair in the remaining 4. There were some pale, anemic looking individuals, and others who seemed below par in health. *Complaints* were not frequent, but the effects of fumes and urinary trouble were brought to the attention of investigators. At one place one man had quit because of this urinary trouble. *Comments.*—(See Enameling) The tendency of many workers to wash their hands in benzine was noted in both this process and that of Enameling.

BRONZING AND GILDING.—These two processes were frequently seen in connection with other decorative work in many industries. Usually females were employed. Very thin sheets of bronze aluminum, and other gilding materials were applied or stamped on with a "size", consisting of thin varnish or a similar solvent, while, other times, these gilds were brushed on from a mixture of them in benzol, acetone, pyroxylin, wood alcohol, amyl acetate or gasoline, and occasionally ammonia, or were sprayed on (in which case a hood and exhaust were used). Again, bronzing or gilding machines, equipped with large gas burners, were usually unvented, and a source of deoxidation and contamination of the quarters in which they were located. None of these "bronzes" were analyzed for lead or arsenic (which they sometimes contain), but no cases of metallic poisoning were discovered among the few workers seen.

LITHOGRAPHING.

This process was investigated in 10 establishments, in 5 cities, and in connection with the following industries: Printing and Publishing, Copper, Tin and Sheet Iron Goods, and Signs and Advertising Novelties. Different methods of designing, photographing, etc., upon stone, zinc, aluminum and other surfaces, as well as press work, are here included.

There were a total of 539 employes so engaged, of whom all but 14 were males. One plant was exclusively a union shop. The work was very largely skilled, the type of workers good, and they appeared to remain at the same places of work to a large extent. There were no benefit organizations, although in 1 place instructions along health lines were given. There were no special health appliances in any place. The general construction of work quarters was good in 5 places, fair in 2, and poor in the remaining 3, while other processes were present in 6 places, such as printing, stenciling, engraving, embossing, and the like. There were a total of 50 workers over 40 years of age, 483 between 20 and 40, and 6 under 20 years.

Environmental conditions were graded as follows: a fair amount of *dust* in 6 places; *disorder* and *dirt* in 1; in 2, *light* only fair; in 2, quarters overly *warm*; and in 8, risk of contracting *communicable diseases* from the promiscuous spitting upon floors, absence of cuspidors, inadequate washing facilities, and the use of common drinking cups and towels. *Fatigue* was a fair hazard in 5 places, due to constant standing, monotony, piece-work, eye-strain and loud noises (from presses). Litho-engravers, designers and artists

had the same hazards as elsewhere described. The workday was from 8½ to 9 hours in 3 places, and from 9½ to 10 hours in 7 places, while the noon recess was 1 hour in 4 places, ¾ hour in 1, and ½ hour in the remaining 5. In 1 place a night shift of 12 hours was maintained, while overtime work was some feature in other places. The general *ventilation* of workrooms was good in 3 places, but fair to bad in the remaining 7, due, somewhat, to contamination from gas, fumes and vapors, but, mostly, to stagnation of the air. Occasionally pollution from city smoke in the quarters of upper floors was frequent. The chief *poisons* in connection with the process were found to be the various colors, inks and greases used (but, except for skin affections, the risk from these sources did not appear to be great, especially for the class of workers employed), turpentine fumes, benzine and, occasionally, anilin used in cleaning, and nitric acid in spray "cutting" of plates, which in one place turned that part of the worker's hair, which was exposed, red-brown in color. The risk to the workers from poisoning appeared to be negligible in 6 places, but a fair hazard in the remaining 4. Nauseating *odors* from rosin, inks, and fumes were marked in some places. The industrial inducement to *stimulantism* was principally a question of the depressing influences of the air in the workrooms, to which the poison factor should be added.

The general *appearance* of workers was good in all places, while there were no special *complaints* made, except as related to ventilation, and occasionally to sanitary inconveniences. *Comments*.—(See Printing—Art Work, Press Rooms). In some instances it would seem advisable to put a hood and vent over the lithographing presses.

UPHOLSTERING.

This process is an auxiliary one in certain industries. We here report upon it as performed in 3 automobile plants, 6 carriage plants, and in 5 furniture plants. In these 14 plants there were found to be employed at upholstering a total of 304 wage-earners, of whom 219 were males and 85 were females. Apparently modern methods were the rule in 12 places. There were no labor organizations. An intelligent type of workers was employed in 12 places, fairly so in 1, and largely non-English speaking foreigners in the remaining 1. The attitude towards employes seemed excellent in 10 places, fairly so in 2, and not so in 2. Health appliances to remove or confine dust were absent in all places, but occasionally respirators were furnished. In but 1 plant were the workers protected by a sick benefit organization. All workers were skilled in 2 places, a fair percentage were so in 3 places, and the majority unskilled in 9 places. There were 33 of the total number who were over 40 years of age, and 5 who were under 20 years. Work quarters were hygienically constructed in 4 places, fairly so in 5 more, and not so in the remaining 5. In half of the places other processes were carried on in the same room, such as painting and varnishing, packing, and various factory procedures. Also these workers were apt to be doing other things than upholstering at times. Retention of workers was good in 10 places, fair in 3, and not so in 1.

The work was so performed that *dust* was a negligible factor in 4 places, a fair hazard in 3, and more so in the remaining 7. Its composition was principally excelsior, hair, hay, flax, tow, moss and vegetable fiber. Quarters were *clean* in 4 places, fairly so in 6, and not so in 4. *Humidity* was no factor. On the other hand, the dust tended to keep the *air* excessively dry in numbers of

places. *Light* was good in 12 places, fair in 1, and poor in 1. General room *ventilation* was good in 4 places, fair in 7, and poor in 3. Often this was influenced by paint and varnish fumes from other processes, and faulty heating appliances. *Heat* is not a feature of the process, but inefficient heating was found to exist in 4 places. *Fatigue* was no hazard in 5 places, a fair hazard in 8 places, and considerable in 1, due to hurrying piece-work, monotony, constant standing, and occasionally some eye strain. The work day was between 8½ and 9 hours in 7 places, and 9 to 10 hours in 7 places; the noon recess was 1 hour in 5 places, ¾ of an hour in 5, and ½ hour in 4 places. The risk of contracting *communicable diseases* was fair in 5 places and bad in the remaining 9, due to such factors as crowded quarters, promiscuous spitting, absence of cuspidors, dry sweeping, common cups, inadequate wash-places and closets, lack of physical examination and medical supervision. Animal *infections* from the *materials* handled were not found. *Poisons* are not used in the process properly, but in some places workers were exposed to paint, varnish and wood alcohol, needlessly. Inducement to *alcoholism* and stimulants was negligible in 6 places, fair in 5, and bad in 3, due to inadequate drinking water facilities, lack of interest in employes' welfare, the irritating effects of dusts inhaled and swallowed, and other depressing influences as mentioned.

Appearances of the workers were generally good in 12 places, but in the remaining 2 several were observed who seemed out of health. The *complaints* of workers were the irritating effects of the fine dusts breathed, more pronounced in the case of certain mosses and hairs. *Comments.*—This being a dusty occupation of difficult control, all persons entering it should be physically examined first, and medically supervised at intervals thereafter, and should use some form of a light respirator whenever the work produces sneezing or coughing.

According to the U. S. Mortality Statistics Report (1909) there were 327 deaths among Upholsters, of which number 65, or 19.8%, died of consumption.

SEWING.

The process considered is that of sewing machine operations, although some few hand workers are included in the totals of employes mentioned. The process was investigated in 26 establishments, in 7 cities, and employed a total of 4,205 wage-earners, of whom 793 were males, and 3,412 were females. The different industries covered were: Clothing (including men's and women's garments, mittens, and underwear), Regalia, Hats, Mattresses, Shoes (cloth processes only), Mittens, Fur Goods, Bags, Coffins, and Automobiles (trimmings).

Mortality Statistics including pulmonary tuberculosis for this class of workers have been considered under the subject of Clothing and Textile Manufacturing (Part IV.).

The general methods pursued were about the same everywhere, irrespective of the nature of the goods worked upon. Unions existed in 3 establishments. The employers' interest in workers' welfare seemed very good in 18 establishments, fair in 6 more, and poor in 2 places (employing a total of 150 females). The general type of workers consisted of an intelligent class in 20 places, fairly so in 3 more, while a large percentage of non-English speaking foreigners (girls) were employed in the remaining three. Every

endeavor seemed to be made to keep the same employes in 22 establishments, fairly so in 3 others, while 1 establishment, employing a total of about 350, paid very little attention to the personnel, who seemed to be constantly changing. Health appliances, consisting of mechanical means to promote ventilation, were good in 5 places, but practically absent in the remaining 21. Some establishments, in addition, had excellent rest rooms, change rooms, restaurants, lockers, nurses in charge, and physicians in easy call, etc. In 5 places organized instructions in health conservation were being given. In 3 places sick benefit organizations existed. About half of the total workers were skilled help. The construction of work quarters was hygienically good in 17 places, fair in 3

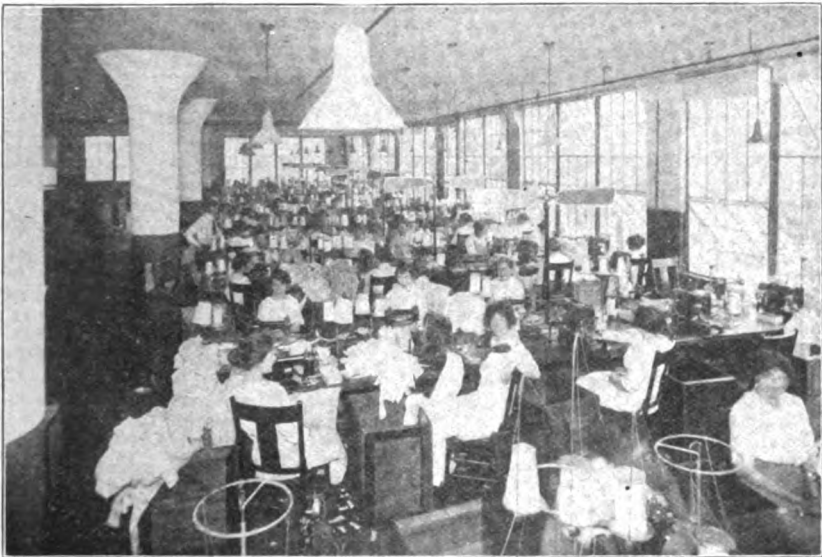


FIG. 47. MODEL SEWING ROOM IN AN UNDERWEAR FACTORY.

Note air-agitators of the draftless type over the workers' heads to prevent stagnation,—the chief hazard in ventilation. Also swing windows for use in fair weather. Also the excellent lighting system, arrangement of workers side-wise to light, chairs with backs, etc. Such conditions increase production because they insure health and happiness.

more, and not good in the remaining 6. In 8 places other processes were carried on in the same quarters with sewing machine processes, such as pressing, cutting and hand-work. Age estimations summed up to show that there were 514 over 40 years of age, and 3,691 under that age, of whom probably 25% were under 20 years.

A certain amount of fiber and textile *dust* is created by the running of cloth through sewing machines, but in 17 places this appeared to be very small in amount, while in the remaining the character of the goods handled seemed to create a good deal of *dust*, enough to make it a considerable hazard in at least 6 places, employing a total of about 775 workers. It was composed of

hemp, cotton, wool, leather, polish, hair from furs, etc., according to the nature of the goods worked upon. In some places the workers were covered with this lint and dust and coughed almost constantly. General cleanliness of *quarters*, which included the frequent cleaning of floors to collect up dust and lint, was good in 17 places, fair in 6 more, and bad in the remaining 3. Dry sweeping or brushing up during work hours was a fairly common observance. Natural light was good in 18 places, fair in 5 more, and bad in the remaining 3, one of which employed about 225 workers. In a considerable number of places, artificial lighting was by naked electric lamps, so placed that they were very damaging to the eyesight of the workers because of the direct light into the eyes. In numbers of places, workers were seated facing windows and other sources of light, while attention was given to seeing that light arrangements were perfect in other places. Light window shades helped materially. The general *ventilation* of working quarters was good in 15 places, due either to general spaciousness of quarters, or to mechanical means of promoting the circulation of the air; it was fair in 6 more, and bad in the remaining 5 (where a total of about 500 workers were employed). *Heating* arrangements were usually good, although there was a general tendency to keeping room temperatures too high in the winter seasons, which, combined with the excessive dryness of the air (see discussion upon Humidity in Part III.) was depressing and predisposing to lung troubles. One place, employing 120 girls up next to the roof, was very warm and close. The chief hazard in this work is *fatigue*. Practically the whole gamut of fatigue factors were found to be active, different ones varying in prevalence in different places. In descending order of importance they were: "bowed over" postures; hurrying piece-work; evidences of speeding up; monotonous application and concentration; eye-strain (in one large place 51% of girls wore glasses; probably many more needed them); loud noises; long hours; chairs and stools without backs; prolonged straining movements; jarring and jiggling of certain forms of machines; and here and there laborious work, constant standing, and using the body to press constantly against objects. The workday was found to be 8 hours in 1 place, 8 to 9 hours in 6 places, and from 9 to 10 hours in the remaining 19. The noon recess was 1 hour in 12 places, $\frac{3}{4}$ hour in 1 place, and $\frac{1}{2}$ hour in the remaining 13. Overtime was very seldom resorted to (laws governing the workday for females prevent this beyond the 10-hour limit). As the work is very sedentary, most of the muscles and nervous mechanisms of the body are out of function a great part of the time, so that autotoxemia, due to sluggish circulation, is an added factor to the fatigue toxins produced in the parts used. In other words *inactivity* is a very potent principle in the diseases of this class of workers. In a number of places this was recognized, and work variation such as the requiring of employees to get up from their seats and secure their own working materials and to deliver the finished goods were resorted to. (A short recess twice a day would help immensely). Furthermore, in some places gymnasium and outdoor recreative features were supported. The liability to the contraction of *communicable diseases* was something of a hazard in all places, although pretty well guarded against, in at least 6 establishments. In one place the whole building (5 floors) was fumigated twice a month with sulphur—a pipe system distributing the fumes. In 7 others, also, no more than the usual risks of indoor workers appeared to prevail. In the remaining 13 the hazards seemed considerable. The principal factors were the presence of a large number of

persons more or less crowded together in the same rooms, the use of common drinking cups, roller towels, dressing rooms without individual hooks or lockers, and in numbers of instances inadequate washing facilities, as well as other sanitary inconveniences. In a number of places where men were employed in large numbers there was considerable spitting upon the floors, and a general absence of cuspidors. The short intervalled handling of objects by different persons was also a feature. In but 3 or 4 of the larger places were physical examinations required of new employes, while, as our case records show elsewhere, numbers of consumptive workers were at work in the midst of the others without any provisions for meeting the situation. The only *poison* to which workers were found subjected was the use of benzine or naphtha in association with other processes (cleaning, cementing) carried on in the same quarters. The industrial inducement to *stimulantism* existed in the prevalence of two causes chiefly—fatigue and inactivity.

The general *appearance* of the workers was contented, happy, and on the whole fairly healthy in 14 establishments, but somewhat less so in all these respects in the remaining 12, in which about a half of the total employed were found. Employes, as a rule, made but few *complaints*. Those heard consisted of eye-strain, headache, backache, lack of recess intervals, dust (especially in mattress and sack or bag factories), poor ventilation, "killing pace" at which it was necessary to work to make a living, coughs, colds, and the like. It is necessary to say that only a very few workers were interviewed personally.

Comments.—As the consumption rate is high among this class of employes, managements should give special attention to the hazards mentioned above, and make arrangements for a medical supervision which will provide, early enough, for the removal and proper care of consumptive persons, and a general protection of the balance. Physical examination of new employes should be insisted upon, including the eyes. Nystagmus, or dancing pupils, is said to affect one-fourth of all sewing machine operators, due to strain of the eyes in following the stitch through the cloth.

IRONING AND PRESSING.

This hand process requires no special description. It was investigated in 21 establishments, representing such industries as Dry Cleaning and Dyeing, Regalia, Hats, Textiles, and Clothing Manufacture. (The process in laundries is considered elsewhere.) There were 570 employes so engaged, of whom 396 were males and 174 females. In all but 3 places modern methods were used. No union organizations existed. The attitude toward employes appeared good in 18 places, fair in 2 and not so in 1. Although a large percentage of foreigners were employed, they were of an intelligent type in 18 places, and remained well at the work in the same number of places. Health appliances, in the nature of room exhaust fans, air agitators, and hoods over large work, were good in 1 place, fair in 5, and absent in the remaining. In but 1 plant did a sick benefit association exist. The work is semi-skilled. There were 120 workers over 40 years of age, 433 between 20 and 40, and 17 under 20. The construction of work rooms was hygienic in 14 places, fairly so in 5, and not so in the remaining 2. Other processes were present in 5 places, such as sewing, cutting, printing, and factory work.

Dust was no feature of the process. Quarters were well *lighted* in 17 places, fairly so in 1, and not so in 3. General room *ventilation* was good in 8 places, fair in 9, and bad in the remaining 4, due principally to still, "dead" air, incomplete oxidation of gas burners for heating, and absence of methods to renew the air. *Heat* was a negligible factor in 13 places, fairly so in 5, and bad in the remaining 3. It is difficult to find a more *fatiguing* procedure than hand ironing or pressing when such is the operation constantly pursued day after day. The number of persons with fatigue neuroses, particularly affecting the arm used, which appear at dispensaries and hospitals attest to this. Often-times there is added neuritis and partial paralysis. In the plants investigated fatigue was a bad hazard in 6, fair in 8, and about negligible in the remaining 7. The chief factors were hurrying piecework, monotony, constant standing, constant strain, stools (where used) without backs, continued faulty postures, jarring processes, and constant pressure against the body. The workday was 8 hours in 1 place, 8½ to 9 in 11 places, and 9½ to 10 in 9 places; the noon recess was 1 hour in 9 places, ¾ hour in 2 places, and ½ hour in 10 places. The liability to *communicable diseases* was bad in 6 places, fair in 12 and negligible in 3, due principally to overcrowding (irrespective of room space), absence of lockers or clothes rooms, common towels and cups, poor washing facilities and closets, promiscuous spitting, absence of cuspidors, and the handling of articles which, in some places, might carry infection. There seemed to be a rather doubtful moral tone in some places employing both sexes together. Medical supervision was good in 3 places, but absent in the balance. The liability to *poisoning* was a negligible factor in 17 places, but in the remaining 4 it was fair to considerable. The dangers were escape of unburned gas fumes, the use of gasoline or naphtha in the same quarters (unventilated), and, in 1 place, of wood alcohol which workers used, even, to wash their hands. The inducement to *stimulantism* was in direct proportion to the extent of the hazards above mentioned.

The general *appearance* of workers was fair to good in 15 places, and not so in the remaining 6. The chief *complaints* of workers were hot work-rooms, gas odors, steam and dampness, fatigue effects, rheumatism, and "nervous breakdowns". *Comments*.—Outside of the usual ventilation and sanitary requirements, considerable thought should be given to varying this process and limiting piecework, speeding up, and constant standing.

JUNK.

The workers in junk sheds and warehouses are engaged in the sorting of waste, rags, paper and metal. Occasionally non-ferrous metals (especially lead) are melted down, much as in brass founding, and cast into ingots or pigs to be sold.

Our investigations covered 25 establishments (exclusive of paper manufacturers) located in 5 cities employing 350 wage-earners divided as follows:

<i>Process.</i>	<i>No. Establishments.</i>	<i>Males.</i>	<i>Females.</i>	<i>Total.</i>
Paper and Rag Sorting.....	20	203	71	274
Refining Metals	4	33		33
Waste Mfg.	1	158	10	168
	25	394	81	475

Age-group estimations summed up 50 males and 26 females over 40 years of age. There were a few under 20. There were 2 places, including the waste works, which had improved methods for handling materials. There were no unions. The attitude toward employes seemed bad in 6 places, and but fair in 7 more. A class of ignorant foreigners were employed in 17 places, while retention at the work seemed poor except in 4 places. Health appliances, consisting of dust removal systems locally applied and hoods with exhausts over metal pots, were present in 2 places, but in 1 of these very inefficient. There were no instructions or health placards in any of the establishments including those which brought the workers in contact with poisonous metals and fumes. None of the workers were industrially insured against ill health. There was no skill required in the processes. Work places were hygienically constructed in 2 instances only, while there was little attempt anywhere to separate various sub-processes.

The exposure to *dust* was a bad hazard in 17 places, its source being the rags, paper and metals handled. Quarters were very *dirty* and disordered in 19 places, while a fourth of the places were practically unprotected from the weather. The *light* was very poor where the workers were engaged in 8 places. Confined quarters giving poor opportunity for *ventilation* constituted a bad hazard in 13 places, and fairly so in 3 more. *Heat* was a bad hazard in 1 place employing 10 men. Chilling from winter *cold* was a hazard to the workers in $\frac{1}{2}$ of the places. In one place employing 17 men and women the only heat was from unhooded salamanders, the gas from which filled the quarters. *Fatigue* was a considerable hazard in at least 3 places employing girls, due to absence of seats, piece-work, faulty postures, and the like. In 1 place 3 females were seen seated upon the floor, there being no chairs nor stools provided. The workday was found to be 8 hours in 1 place employing 12 persons, of whom 9 were females, but was 10 hours or longer in all the rest where reports could be obtained. The noon recess was 1 hour in 5 places, $\frac{3}{4}$ hour in 1, $\frac{1}{2}$ hour in 10 places, and no regular time taken in the balance. How much overtime was put in could not be ascertained. The liability to the contraction of *communicable diseases* was great in 18 places, fairly so in 2 others, negligible in 1 more, and was not definitely reported upon in the remaining 5 places. The chief hazards, besides the handling of the materials, were inadequate or absent wash-places and closets (occasionally the same closet was used by both sexes), promiscuous spitting, absence of cuspidors, and lack of any medical supervision. *Poisoning* was a great hazard to 85 workmen in 10 places where lead and soft metal alloys were handled and smelted. In 1 place 5 tons of lead were melted at a time. The likelihood of "brass chills" was slightly less than in brass foundries. The work was done by ignorant workers who received no instructions as to dangers, were generally without washing facilities, and ate their lunches while at work. Hoods to remove fumes from melting pots were absent in all except 1 place, but a few of the places had the melting pots outdoors. The industrial inducement to *stimulantism* was of course great in all places where dust, depressing surroundings, poor heating arrangements and poisons existed along with the absence or inadequacy of drinking water facilities. There is a question also of the propriety of employing both males and females together in the sorting of old rags, etc.

The general *appearance* of workers was fair to good in 10 of the plants (none, however, engaged in handling metals). The workers, as a rule, were very reticent about making complaints, but the ill effects of dust, insanitary

quarters and long hours were complained of by them. Our investigators discovered 4 cases of lead poisoning in 2 smelting plants, 2 cases of tuberculosis, and the report that several cases of lockjaw had come from 1 of the large plants.

Comments.—Where metal melting pots are placed indoors they should be properly hooded and vented. The grinding and beating of rags and paper should have dust confining or collecting systems. (These were observed in 1 place.) We were unable to make an intensive study of the possibility of infectious and contagious diseases among the workers who were handling rags and materials collected from all sorts of places, but in this connection an outbreak of smallpox in a manufacturing establishment was laid to the use of old rags bought for cleaning machinery. Of all workers these should have the best of sanitary conveniences as well as first-aid remedies for cuts, punctured wounds, burns and the like.

(This completes the discussion of General Processes; next Special Processes will be taken up, beginning with the Printing Trade.)

SCHOOLHOUSE LIGHTING.*

G. H. STICKNEY,

*Assistant Sales Manager, Edison Lamp Works, General Electric Company,
and Member of the Museum's Illumination Committee.*

The members of the rising generation begin to apply their eyes to close vision in the school room. At this period of life, when the pupil is growing rapidly and storing up the reserve for future struggles, it is important that the conditions be made such as to facilitate that growth, and minimize the burden of application.

The lighting of school rooms is one of the factors which has been sadly neglected, if we may judge from many of the examples in almost any city. The importance of proper lighting in its relation to the development of a child is evident, if we stop to consider the harm which may result from poor illumination in the way of—

- (1) Injury to eyesight,
- (2) Injury to health,
- (3) Interference with school work.

Recognizing the importance of securing greater activity toward the betterment of school lighting, the following outline has been prepared, with a view of calling attention to some common faults in the present lighting, and thus suggesting methods of improvement.

Such a treatise must necessarily be elementary and incomplete. Different rooms will require different treatments which can best be

* Adapted from "Safety," 1915.

determined by architects or consulting engineers, skilled in the art of illuminating engineering. The importance of the lighting problem of any school warrants the service of such expert talent.

DESIRABLE QUALITIES OF SCHOOLROOM ILLUMINATION.

INTENSITY.

Sufficient intensity of illumination should be provided in all parts of the room to permit reading without eyestrain. *The minimum intensity on the desk surface should not be less than 2.5 to 3 foot candles.* A higher intensity is generally desirable, especially for daylight.

DIFFUSION.

Light from bright sources, either received directly or reflected by glossy surfaces, produces glare, with accompanying discomfort and interference with vision, the possibility of which should be prevented. Deep shadows and excessive contrasts in illumination should also be avoided.

It is essential to make sure that a reasonable degree of diffusion is provided, in order to avoid: (1) *glare* as noted above; (2) deep shadows or *extreme contrasts of intensity*.

The conditions mentioned interfere with vision, produce discomfort and, when encountered for long periods of time, cause serious injury to the eyes.

The most common method of reducing the objectionable brilliancy is by the interposition of translucent materials.

(Note). It is not desirable to secure the other extreme of perfect diffusion or shadowless illumination, as shade and shadow of proper density and gradation, are helpful and reduce the effort of seeing.

DIRECTION OF LIGHT.

It is important that the predominant light falling on a pupil's desk should be such as to avoid the following objectionable conditions:

(1) Dense or definite shadows falling on the active portion of the desk. Such shadows may be cast by the pupil's head, shoulder, hand, etc.

(2) Direct light in the pupil's eyes.

(3) Light reflected from desk top.

Light falling obliquely downward from the left or right, is to be preferred. As the majority of pupils use the right hand in writing, light from the left is less liable to produce objectionable shadows of the hand. In any case pupils should not be made to face the light.

STEADINESS.

Flickering light should always be avoided, as it is a source of strain. Slow changes of intensity, as long as they do not go below the limit for good seeing, are not objectionable.

COLOR.

Daylight is, of course, the most desirable from the standpoint of color, but the yellow tinted light produced by the ordinary artificial illuminants is entirely acceptable.

ROOM SURFACE.

As far as possible, glossy finished surfaces should be avoided as they tend to produce glare, and interfere with vision. This applies to finish of furniture, walls, ceilings, blackboards, desk tops, paper and text books. The ceiling should be dull white or a very light tint. The upper walls should be of light tint, approximately neutral in color. The lower walls should be medium, rather than very light or dark. Dark surfaces in the upper part of the room not only cut down the effective illumination but also reduce the diffusion.

INTENSITY.

DAYLIGHT.

Ample provision for window area should be made to insure good natural intensity of illumination throughout the room. Allowance should be made for the dark days of the winter season, and the use of diffusing materials at windows, on bright days, as mentioned below.

DIFFUSION OF LIGHT.

Provision should be made to exclude direct, undiffused sunlight from the schoolroom. This applies also to sunlight reflected from windows of neighboring buildings. The judicious use of translucent shades or diffusing window glass, is the most effective method.

DIRECTION OF LIGHT.

For ordinary schoolrooms the light from side windows is preferable to that from skylights. The seating should be arranged so that the predominating window light comes from the side—preferably the left. In no case should the class be required to face the windows.

Blackboards and charts should not be placed between windows. In that position they are poorly lighted, and on account of the contrast with the brightness of the windows, cannot be viewed well or without strain.

ARTIFICIAL LIGHTING.

INTENSITY.

Lighting installations should be planned to supply approximately even intensity throughout the room. Sufficient intensity should be provided to exceed the minimum of 2.5 to 3 foot candles, allowing for:

- (1) Variation of supply pressure.
- (2) Reasonable depreciation of illuminants.
- (3) Ordinary accumulation of dust.
- (4) Darkening of ceiling and wall surfaces with time.

DIFFUSION OF LIGHT.

All modern illuminants, suitable for schoolroom lighting, are too bright to be viewed with comfort. They should be therefore located high out of the ordinary line of vision and provided with suitable equipment for diffusing the light. (See "Lighting Methods" below).

DIRECTION.

In artificial lighting it is not ordinarily practicable or necessary to have a predominating, lateral direction of light as in day-lighting. The lighting equipments should be such that the predominating light is projected at oblique angles.

STEADINESS.

Illuminants for schoolroom lighting should be of the type that produce steady light, free from flicker or rapid fluctuation.

COLOR.

While color of light is an important factor, any of the ordinary illuminants, likely to be selected for schoolroom lighting will give light of suitable color.

LIGHTING METHODS.

There are three principal types of light redistribution which are applicable to schoolroom lighting; namely, direct lighting, indirect lighting and semi-indirect lighting. The selection among these depends upon local conditions, decorative values, cost and other considerations. It is practically never desirable to use individual lamps.

Direct lighting is accomplished by means of reflectors or globes from which the greater part of the light is distributed directly, although part of the illumination may be received by reflection from ceiling and walls. The old-fashioned chandeliers fall in this class, but, generally, should be avoided as they are ineffective, glaring and inartistic.

The later styles of direct lighting units are hung higher, being arranged to distribute the light downward more efficiently than the chandelier. In selecting such units care should be taken to make certain that glassware is of such quality and form as to assure good diffusion. Excessive glare is one of the commonest faults in direct lighting.

This method is usually a little more efficient than the others, but requires a narrower spacing of lighting units, in order to insure proper direction of light.

Indirect lighting is accomplished by means of opaque reflectors so arranged as to conceal the source from view and direct all the light on the ceiling or walls for redistribution through the room. This method is applicable only in rooms having white or very light ceilings, free from beam and truss construction.

A high degree of diffusion is inherently provided; in fact, the tendency is, in some cases, toward the other extreme. While more power is usually required than with direct lighting, a wider spacing of units can be employed, since a large part of the ceiling area becomes the apparent light source. This method has, however, proved highly satisfactory in many cases. Some very pleasing designs of fixtures are available.

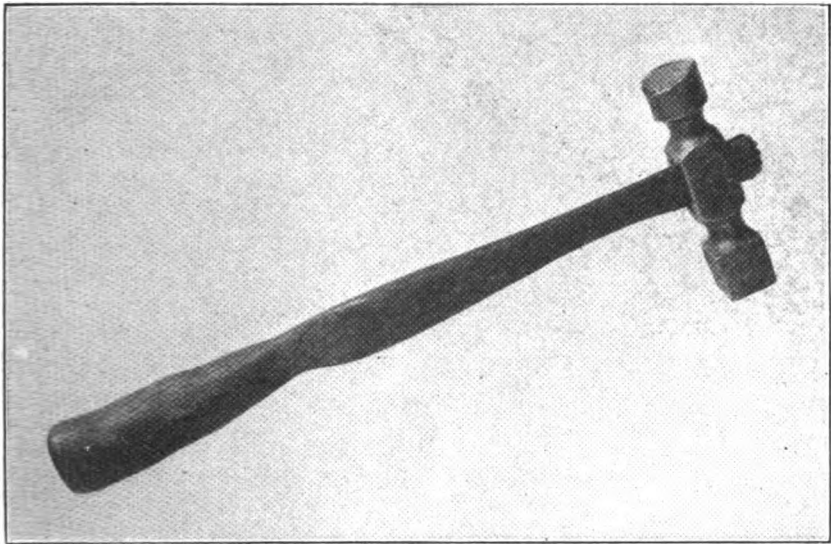
Semi-indirect lighting is, in a way, an intermediate method between direct and indirect lighting. The light source is concealed by means of a translucent reflector, so that while the greater part of the light is projected on the ceiling or walls, for redistribution, a considerable portion is transmitted through the reflector and distributed directly. With proper density of the reflectors no brilliant light sources are visible, while an excellent diffusion of light is secured.

With regard to the factors of efficiency and spacing, semi-indirect lighting generally falls between the other two methods. Many artistic fixtures of this type are available and the lighting effects can be made very pleasing and attractive.

SPECIALIZATION VERSUS TOLERATION.

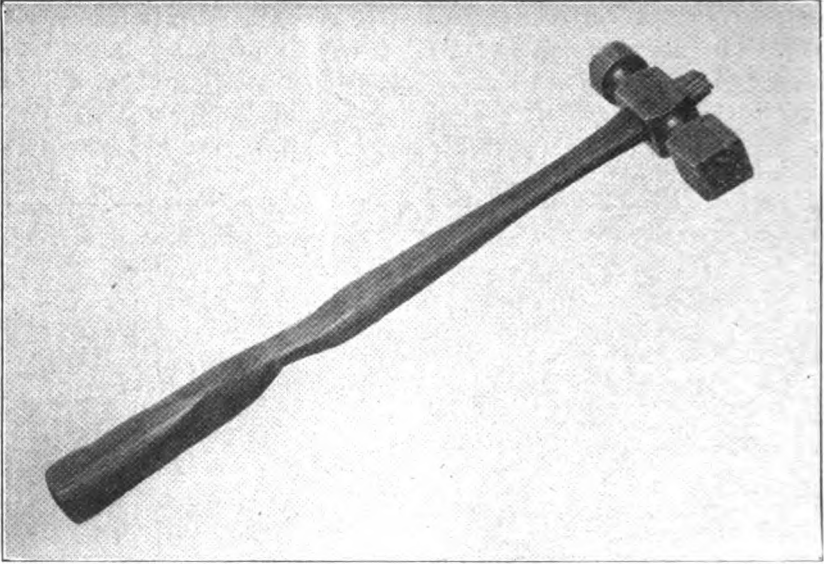
Experience of An Electrotpe Finisher.*

The accompanying cuts show a hammer which was used for sixteen years by an electrotyper in the city of Columbus. The man's particular process is that of finisher in which he is required to level down the cast electrotype plate by means of a hammer and a small steel block, called a masher, or hurdy-gurdy, or "paralyzer." This highly specialized form of work requires his attention from seven to eight hours constantly each day. His chief symptoms are weak-



ness and paresthesia of both hands, arms, and fingers, with evident wasting of the thenar and interosseous muscles. The hand dynamometer showed four-fifths normal strength in right hand and three-fifths only in left hand. His main complaint is the left hand which holds the masher. He rightfully attributes his affliction to the constant jar from striking the steel hammer on the steel masher which is applied to the metallic electrotype on top of a metal table. Reflexes are normal in both arms; symptoms and findings are otherwise negative. A most interesting feature in connection with this case is the hammer. Its steel striking end has been worn down about half an inch, while in the hickory handle are worn deeply the imprints of the

grip of each of the fingers of the right hand. Some of these imprints are fully one-half inch deep. This gives some idea of the constant application it must have required to wear a hickory-handled hammer down to this extent. The prevention of this type of occupational degeneration lies in varying the work several times during the course



of the day, which could be done quite easily in this particular trade-process.

The case is an illustration of the point that there is a physiological limit to specialization. — E. R. HAYHURST, M. D., *Director Division of Occupational Diseases*.

SANITARY DRINKING WATER PAIL.

**Used at the Lorain (Ohio) Works of the National Tube Company
in Places Where a Water Supply is Not Available.**

This pail is practically dust-proof, and the closed lid prevents the common practice of dipping water out of the pail. The cups, when not in use, are carried, as shown, with the bottom side up, so that they will drain and not collect dirt. The removable lid is large enough to receive broken ice, and is a means of access for thorough cleaning.



(The scheme does not, however, do away with the hazards of the common cup since one employe after another may use the same cup at frequent intervals. It would appear easy, however, to substitute paper cups or to place a valve controlled "bubbler" on one side near the bottom and so do away with cups altogether.)

JUNE MEETING OF THE STATE BOARD OF HEALTH.

The regular meeting of the State Board of Health was held in Columbus June 3, 1915. Representatives of the village of Napoleon were present with a request for immediate action in the approval of plans for proposed water purification plant. The explanation was made that these plans had but recently been completed and could not be submitted for preliminary investigation before being acted upon by the Board and that it has been found advisable to let the contracts for construction before July 1st. The representatives of the village were advised that plans should be submitted at the earliest possible time and that these plans would be examined by the division of sanitary engineering and that they would be notified in advance of the meeting of the Board of the recommendation of the engineers. The Secretary was given authority to approve these plans, subject to approval by the Board at its next regular meeting.

The city engineer of Marietta presented a statement in regard to the improvement of the public water supply of that city. He informed the Board that preliminary plans had been prepared and

asked that a representative of the Board be sent to Marietta to advise in regard to the detail of plans before the plans are submitted to the Board for approval. This request was referred to the Secretary with instructions to have an investigation made by the division of sanitary engineering.

The minutes of the meeting of May 4th, the monthly and financial reports of the Secretary and the following appointments recommended by the Secretary were made:

L. H. Van Buskirk, B. Sc. in Chem. Eng. Acting Director of Hygienic Laboratories.

Dr. E. F. McSherry, Ass't Bacteriologist and Chemist in the Division of Hygienic Laboratories.

J. Gilbert George, B. Sc. in Agr., Antitoxin Chemist.

Royal S. Durrell, C. E., and

D. E. Adams, B. C. E., Assistant Engineers in the Division of Sanitary Engineering.

H. J. Southmayd, Superintendent of Exhibits in the Division of Public Health Education and Tuberculosis.

The Board approved plans for a proposed water supply for the Central Allotment near Akron, upon condition that all dwellings within 500 feet of the supply well shall be provided with sewer connections and that all sewers shall be constructed with watertight joints; also that the supply be abandoned as soon as connections can be made with the water distributing system of the city of Akron.

Plans were approved for a proposed water supply for the village of Rittman upon condition that the village council pass an ordinance prohibiting the establishment or maintenance of any privy vault, cess-pool or other possible source of contamination within five hundred feet of any well.

Plans were approved for proposed water supply and water purification plant for the village of Wellington upon conditions that the filtering material and detail plans be satisfactory to the State Board of Health; that a competent operator be employed and that no connections be permitted whereby water from the existing supply may reach the distributing system conveying the filtered water.

The Board approved plans for the water purification plant for the village of Woodsfield to be constructed by the Woodsfield Water Company. The company is required to provide proper superintendence and to secure the approval of the filtering material to be used.

Plans for a proposed sewage treatment plant for the city of Akron were approved upon conditions that filtering material be satisfactory and that proper superintendence of the plant and sewers be

provided. The plans now approved are modifications of detail plans which were approved by the State Board of Health some months ago, the modification of the plans being made necessary by the inability of the city to raise sufficient funds for the completion of the plant as first designed.

Owing to the financial condition of the city of Canal Dover, a request was made for permission to omit for the present the construction of sewage treatment plant to be used in connection with the new system of sewers. The Board approved the request preserving the option of requiring the installation of sewage treatment plant when deemed necessary. The city has a contemplation that it will be able to build a plant within a period of three or four years and the Board believes that the condition of the Tuscarawas River which receives the sewage cannot be seriously affected in that length of time.

The Board approved plans for proposed sewers and sewage treatment plant for the village of East Palestine with the condition that no connections be made to the sewers until the plant has been completed and that the village council pass and enforce an ordinance regulating the proper use of sanitary and storm water sewers and providing for the operation and maintenance of the treatment plant. Devices for the electrolytic treatment of the sewage are to be abandoned and other devices for secondary treatment installed when deemed necessary by the State Board of Health to secure satisfactory efficiency and to prevent the pollution of the streams which receive the sewage effluent. The approval of this sewerage system and sewage treatment plant does not include an approval of the proposed process of electrolytic treatment but permits this installation and trial until such time as the State Board of Health can determine its efficiency.

Plans for sanitary sewers in the Main Sewer District No. 6, Lucas County, were approved subject to the condition that detail plans shall be submitted for approval and that the proposed outlet into Ten Mile Creek be abandoned as soon as an intercepting sewer shall be constructed. The approval becomes void unless an agreement to provide for connection of the proposed sewerage system with the so-called Ten Mile interceptor shall have been entered into by the board of county commissioners of Lucas County and the council of the city of Toledo prior to the construction of the proposed sewers.

The Board approved plans proposed by the Belle Vernon-Mapes Dairy Company for the disposal of the wastes from the milk plant located at Novelty, Geauga County. This action on the part of the dairy company is caused by a complaint of the pollution of a stream with the wastes from the milk plant.

A report was presented by the division of sanitary engineering on investigation of the complaint that Burke Brook in Cleveland was being contaminated by sewage and other wastes. The investigation shows that conditions are not such as to warrant the State Board of Health in taking action under the provisions of the Bense Act. The Board voted to refer the matter to the city council with a recommendation that steps be taken to provide other means for disposing of the wastes than by discharging same into Burke Brook.

As a result of an investigation under the Bense Act of a complaint that the city of Akron is responsible for the pollution of the County Infirmary Ditch, the Board found that improperly treated sewage from the city of Akron is being discharged into the county infirmary lateral ditch and has so polluted that ditch as to give rise to foul and noxious odors and to conditions detrimental to the health and comfort of citizens of Portage Township, Summit County, residing in the vicinity of said ditch. The city of Akron will be given a hearing on the complaint and finding before further action is taken.

A complaint was presented from the Trustees of Big Island land Township, Marion County, in which it is stated that the city of Marion has caused the pollution of the Scioto River to the extent of creating a public nuisance. The complaint was referred to the division of sanitary engineering for investigation and report.

The Board confirmed the appointment by council of the following health officers:

Crown City, Dr. R. R. Sayre.
LaGrange, Dr. Thomas A. Bickerstaph
Lewisville, J. W. Denbow.
Mineral City, Dr. Chas. H. Sawyer.
Mt. Pleasant, Albert Waite.
Ottoville, Dr. J. F. Cokuly.
Perrysville, Dr. Allen W. Budd.
Pioneer, Leander Wisman.
Roseville, Arthur E. Mauler.
Sherrodsville, Harry R. Belknap.
Unionville Center, Jacob Mapes.
Verona, V. O. Weaver.
Higginsport, Charles Miller.

Upon the recommendation of the State Inspector of Plumbing, the Board voted to request the Attorney General to prosecute the firm of Kreamer & Weber of Canal Dover for installing the plumbing contrary to the provisions of the Ohio Building Code.

The following resolutions adopted by the State Commission for the Blind were presented:

"WHEREAS, The State Commission for the Blind, with the assistance of its Advisory Board of Physicians, caused to be prepared for presentation to the Legislature a bill aiming to further reduce the unnecessary loss of sight in this state which results from ophthalmia neonatorum (H. B. 470), and

WHEREAS, This bill is now a law and the State Board of Health, which will be responsible for its operation, has every prospect of receiving the funds necessary for the carrying out of the law, and

WHEREAS, The law creating the Commission for the Blind states that "It shall be the duty of the Commission to co-operate with the State Board of Health in adopting and enforcing proper preventive measures," and

WHEREAS, The Commission for the Blind now has six nurses giving their entire time to eye difficulties and it is the very earnest desire of the Commission to make the eye nursing service work of the state the most effective in the country, Therefore Be It

Resolved, That the State Commission for the Blind extend to the State Board of Health the services of its present corps of nurses in their respective territories where a case of ophthalmia neonatorum might be attended by them with the hope that both boards may work out a practical plan for adequately covering, so far as possible, all the territory that is not now served by local health organizations."

The Board voted to express its appreciation of the work that is being done by the State Commission for the Blind and instructed the Secretary to co-operate with the Commission in the enforcement of an act passed by the 81st General Assembly entitled "An Act for the prevention of blindness from inflammation of the eyes of the new born, designating certain powers and duties and otherwise providing for the enforcement of this act."

The Attorney General was requested to advise the Board as to its authority to correct conditions caused by the failure of proprietors and operators of soda fountains to observe sanitary precautions in handling glasses, dishes, etc.

The Secretary was authorized to make the necessary arrangements to take up the analytical work on foods, drugs and fertilizers; this work having been transferred to the State Board of Health from the Ohio Agricultural Commission.

The Secretary was also instructed to formulate plans for the establishment of a Division of Child Hygiene as provided for by the General Assembly and to report on these plans at the next regular meeting.

The next regular meeting of the State Board of Health will be held at Cedar Point on July 12th. On July 13th and 14th, the Conference will be held with the Boards of Health of villages and townships in the northern half of the State.

It is decided to hold an August meeting in Columbus on August 12th.

EDITORIAL SECTION.

Lengthening Life.

It is stated on reliable authority that in India, which is one of the most insanitary countries in the world, the average duration of life is twenty-three years for males and twenty-four years for females. This is, of course, less than half the average length of life in the more civilized countries of Europe and in the United States. Fisher, quoting Finkelnburg, states that in Europe the length of human life has been doubled in 350 years. He states that reliable figures show that life is lengthening today much more rapidly than formerly. Studies of the life tables for early periods in England, France, Prussia, Denmark, and in certain other communities show that during the seventeenth and eighteenth centuries human life was lengthened at the rate of four years during a century and during the first three-quarters of the nineteenth century had lengthened at a rate of nine years during a century. At present in Europe the rate is about 17 years per century and in Prussia particularly the rate is 27 years per century. It is impossible to state exactly what the rate of increase is in this country. Such an estimate can only be based on the statistics collected in the state of Massachusetts, vital statistics having been collected in this state for many years. In Massachusetts the rate of increase at the present time is about 14 years per century. It will be noted that this is approximately one-half the rate of increase in Germany.

It having been established that human life may be lengthened by the observance of right and proper living, it is a pertinent question, therefore, to ask what is being done to conserve and lengthen the lives of our citizens of our own commonwealth. This problem is of importance, as previously stated, not alone from the humanitarian side, but from the financial and economic as well. The total deaths in Ohio for 1913 were 68,399. Out of this number as previously stated a careful statistical study shows that 28,000 of these deaths were from diseases and accidents which are preventable. The preventable morbidity and sickness was about 56,000 cases. If the average human life is worth \$1,700, and this estimate is exceeding low, it can be estimated, therefore, that the economic loss to the state during the year 1913 was about \$47,600,000, and without doubt it was approximately the same for 1914, although statistics are not yet available. It is rather difficult to make an accurate estimate as to the cost

of preventable morbidity or sickness. This involves a loss to the individual, a loss to the employer or business, and a loss to the state and nation. If this loss were on an average of \$1,000 for each case of sickness, which is also an exceedingly low estimate, it would mean that \$56,000,000 were lost to the state as a whole during the year. The total loss to the state, therefore, from preventable causes would total at least \$103,600,000 during 1913. This becomes a problem, therefore, worthy of very careful consideration. It should be a problem of grave concern to all our citizenship. Local, state and national public health agencies are established for the purpose of protecting our citizens against the ravages of disease. Obviously, the principal points of attack must be directed against preventable diseases.

* * *

Preventability of Diseases and Postponability of Death.

Careful studies have been made indicating the preventability of many diseases. These estimates are without doubt extremely conservative. Carefully prepared tables show, for example, tuberculosis as 75 per cent preventable, typhoid fever as 85 per cent preventable, pneumonia as 45 per cent preventable, and diphtheria as 70 per cent preventable. There are also some diseases, such as cancer, which at the present time would have to be stated in such a table as being zero preventable or non-preventable, while in this particular case we know that there is a certain degree of preventability if attention is given to certain matters early enough in life. Ratios of preventability having been determined for many diseases, it is not difficult to estimate the extension which is possible in the average human life by the saving of lives now lost from preventable causes. Every individual has a definite life expectancy at certain age periods. In making calculations as to the extension of human life it is necessary, of course, to base such calculations on the assumption that if an individual be saved from death from a preventable disease he or she will live to the full limit of expectancy, as indicated at the particular age period. In other words, as some one has expressed it, the individual gains a "new lease on life." It becomes a question, therefore, of postponability of death until at least the limit of normal life expectancy.

It can be easily appreciated that all through life factors operate which may improve living conditions and extend the life expectancy. Consequently any estimates of postponability of death at a definite age period would be extremely conservative on account of the good factors, above referred to, which might operate to prolong the life

of the individual. It has been estimated, therefore, on these very conservative grounds that at least eight years could be added to the average human life by merely providing, or supplying conditions which would insure for the individual, pure air, water and good food at all times. It is estimated that if preventable diphtheria were eliminated as one of the health hazards at least a half a year could be added to the average human life; seven months could be added by the elimination of preventable typhoid fever; two years by the elimination of preventable tuberculosis, and almost a year by the elimination of preventable accidents.

At least half of the deaths which occur among infants under one year of age are preventable. One-half of the diseases and deaths of childhood, one-third of the diseases and deaths of middle life and one-fourth of the diseases and deaths of later life are absolutely preventable and postponable. While it is true that investigators have somewhat different ideas as to the percentage of preventability of the various diseases it can be conservatively stated that all agree that at least 33 per cent of all deaths which now occur could be prevented or at least postponed.

* * *

The Electric Bath Treatment of Lead Poisoning.

For something over a year and a half there has been an occasional reference in literature, and at conferences, to what purports to be a new treatment for the prevention, as well as the cure of lead poisoning. The method is that of Oliver and Clague, and can be found described in the recent publication, "Lead Poisoning", by Sir Thomas Oliver, which was issued in the latter part of 1914. The method consists essentially in attempting to electrolyze or deionize out of a person what traces of lead he may have absorbed into his system, particularly in connection with certain forms of work. The apparatus is simple. A wooden tub is required for the feet of the workman, and into it tepid water is placed, while for the hands and forearms similar provision is made. The electrical part of the apparatus consists of a battery, a milliamperemeter, and a rheostat for regulating electrical pressure, also wires and electrodes in the form of grids. The bath is given for half an hour or a little longer every day, or every second or third day, according to the exigencies of the case. Oliver recommends the procedure "as a supplement to the preventative and curative treatment of plumbism", and from certain experiments which he has conducted upon animals and human beings, and from the experiences of Dr. Francis D. Patterson, medical officer to Harrison Brothers White Lead and Paint Mfrs., in Philadelphia, and medical

officer to the Electric Storage Battery Company, the originator, and especially some others, have become perhaps a little too enthusiastic over the possibilities of the treatment, if, indeed, it can be called a treatment at all.

We note, in fact, that certain manufacturing establishments have installed the baths, and that many others are contemplating so doing, and that the lay press is commenting upon it. The chief point of this notice is to issue a word of warning as to the efficacy of this plan of preventing or overcoming lead poisoning. The method has been carefully tried out by two different experimenters, Goadby and Oxley (The Lancet, London, October 3, 1914) both of whom, after a long series of careful experiments upon both animals and men, including the actual attempt to deionize lead from the liver of an animal which had been lead poisoned and then killed, obtained entirely negative results. In the case of the liver experiment mentioned, lead was easily demonstrable to be present by ordinary chemical methods after it had been attempted to extract the same from organ for hours by deionization. It is very probable, as their experiments appear to show, that dissociation of the organic lead compounds in the body, and their dializability through an animal membrane, the skin, in any appreciable amount, are most remote possibilities. The two workers last quoted doubt that it was lead which Oliver's chemist found deposited upon the electrodes, while they deny any improvement in the appearance of the lead line as observed in the gums of human beings, or any other improvements in the symptoms which could be said to be due to the two-bath electrical treatment.

* * *

Ventilation.

There is a great deal in scientific publications, magazines and newspapers at the present time concerning some of the new discoveries and advancements in our knowledge of ventilation. Among other features, it is confusing to observe the different meanings which this word is given by different persons and sources. According to a large dictionary, of recent edition, the word has a wide variety of interpretations: "to open and expose to the free passage of air; to supply with fresh air, and to remove impure air from"; "to provide with a vent or escape for air, gas, etc."; "to change or renew, as the air of a room"; "to winnow; to fan"; "to sift and examine; to bring out, and subject to penetrating scrutiny". Indeed, the word "ventilation" has formerly meant "the act of refrigerating or cooling". In derivation, the term means "to toss, brandish, to fan, to winnow, (from *ventus*, wind)".

Some discuss the term ventilation as referring to the circulation of air, which may be from the outside, and therefore fresh air, or may be simply the re-circulation of air over and over again in the same room or quarters by means of a ventilating plant, or it may be a combination of the two. To others, ventilation, and this appears to be the more recent tendency, incorporates the idea of temperature and humidity relations along with those of motion, and the belittling of the importance of chemical constituents, such as the amount of oxygen and carbon dioxide present.

Whatever may be the construction put upon the use of the term, it appears to be established that what the human being needs is a constant aerial environment nearly like that of a representative autumn or spring day, in which the following standards would be approximated, — *temperature* about 68°, *relative humidity* from 50 to 60 per cent, a perceptible *movement* of the air, but not a strong draft, all of which may be accomplished through the re-use, indeed, of the same air, without apparent detriment to the animal organism. The estimation of carbon dioxide is still valuable as an index to the extent of fresh air which is being admitted. Another index of this is the odor which is perceptible to persons just entering an occupied room which has housed one or more persons for some little time. Neither of these two latter factors appear to be at all deleterious, unless, perhaps, slightly so upon the appetite. While it is desirable to attempt to approach nature in her supply of air as closely as possible, it is pointed out by one of the foremost scientists (Dr. C. E. A. Winslow) that we should differentiate between all which nature supplies, and such features as it is desirable to have. In other words, there are certain atmospheric conditions which are natural, but which are quite inimical to continuous health. We should be in a position, therefore, to pick out the best features and eliminate the balance. A most remarkable deduction is the change in the physiological aspects of ventilation, that is, that we desire the proper air condition, not for its effects upon the lungs and respiratory system, but for its effects upon the skin and thence the circulation of the blood (F. S. Lee). — While the effects of high temperature, both with and without a high degree of relative humidity, have been fairly well established, the effects of low relative humidity, that is, dryness, have yet to be worked out.

* * *

Social Insurance.

The idea of extending our publicly controlled insurance schemes has been rapidly developing throughout the United States. From

private insurance we have adopted state insurance in a considerable number of our states, as contained in our compensation laws for accidents and injuries to persons employed in various gainful occupations. Indeed, in Massachusetts the Supreme Court has decreed that a disease acquired as the result of the occupation is an "injury" coming within the meaning of the law, and is compensatable as such. An article on another page of the present issue takes up this particular instance. In Ohio, the same question has been affirmed in the positive by various lower courts, and a decision from the Ohio Supreme Court is being awaited daily upon this point.

It is well to call attention to the various features of social insurance as they have been developed in some dozen foreign countries, including, indeed, Russia and Servia. No doubt the conflict abroad has seriously disturbed these forms in the various countries at war, to the extent, perhaps, of abolishing the system for the present.

Social insurance, as some of our foremost thinkers conceive of it, embraces insurance against accidents and injuries, all sickness, invalidism, old age, and unemployment. Hence in this country we have only adopted one-fifth of the entire contemplated scheme, and that by far the least significant. This is the feature of compensation for accidents and injuries. So successful has been state supervision of this phase of social insurance in the states where it has been adopted in the United States, that there is no question but that some of our states are in a position to develop the second phase of insurance by the state, that is, insurance against all forms of sickness for all persons employed in gainful occupations. Unlike the scheme for accident insurance in which the employer bears the brunt of the burden (this is only apparent, since the populace really bears it when it buys the products manufactured or the services rendered), sickness insurance appears to be most successfully manipulated by a scheme which divides the cost equally between the employer, the employe and the state. Thus all persons who obtain a position must pay a certain small amount, a few pennies a week, usually, toward insurance against sickness. Likewise, the employer does the same for each worker whom he contracts for, and the state adds its third.

An immediate effect is to at once promote all measures which tend to keep down the causes for which the insurance has to be spent. We see the first fruits of the system in the "safety first" propaganda which we have with us today. In like manner we would see an immediate sudden expansion of all measures tending to prevent sickness and deaths from diseases, should state sickness insurance, or social insurance covering sickness, be generally adopted. An incident in this

development would probably be the ready control of occupational diseases, for, being but one part of the diseases to be compensated for, they would probably early receive an impetus of attention from each of the three elements who must pay the premium for the insurance. Sickness insurance means the injection of the dollar more vitally than ever into the question of the prevention of disease, and on this account we should expect great things to come of it.

* * *

Whooping Cough; an Important Cause of Morbidity and Mortality.

Whooping cough; a disease too often but lightly regarded, causes more deaths in children under one year of age than any other of the diseases commonly recognized as infectious. The deaths from this disease in the registration area of the United States, for 1913 numbered 6,332, representing a death rate of 10.0 per 100,000 inhabitants. Of these deaths 3,442 or 54 per cent were of children under the age of one year, and 6,007 or 95 per cent under the age of 5 years. In Ohio the number of deaths in 1913 from whooping cough was 668 or 13.45 per 100,000 population. The seasonal incidence of whooping cough is not so well defined as in many other diseases, but a large majority of the cases and deaths occur in the spring and summer months. But great as is the number of deaths directly caused by this disease, there is no way of computing the number of deaths from other causes, particularly tuberculosis, which owe their origin to the undermining influences of whooping cough. Yet practically nothing is being done to check the ravages of this disease. In many cities whooping cough is not even quarantined, and even where the local regulations do require quarantine, a large proportion of cases are never reported to the health department. In 1913 the total number of cases reported throughout the state of Ohio was only 10,064 which would indicate a case fatality rate of 66 in every 1,000 cases. This rate is obviously far too high, as it is very doubtful if the true case fatality rate for a state would exceed 20 per 1,000. Assuming, however, a case fatality of 22 for 1913, it is evident that only one-third of the cases were reported, and that consequently quarantine measures enforced against this one-third would be very ineffective in controlling the disease.

The first essential in a campaign against whooping cough is then to obtain reports of all cases. As the bacillus has but slight vitality outside the human body the disease could easily be controlled by efficient health departments if all cases could be immediately located.

PUBLIC HEALTH ACTIVITIES IN OHIO.

Public Health Organizations.

On June 4th, the Greenfield Public Health League was organized with the following officers: president, Miss Myrtle Stimson; vice-president, D. O. Miller; secretary, Mrs. E. J. Patterson; treasurer, Mrs. Neal Waddell.

Public Health Nurses.

On June 24th, Miss Bertha Billiani, permanent public health health nurse employed by the Jackson Public Health League since January 12th, resigned. Her successor has not been employed as yet.

On August 1st, the state law providing for the registration of nurses becomes effective. The State Medical Board has not appointed the Nurses' Examining Committee as yet, but will probably do so at their August meeting. Nurses who desire to be registered should have their applications in the hands of the State Medical Board not later than October 1.

Tuberculosis Hospitals.

On July 1st, the organization of a Joint Board of County Commissioners from Scioto, Pike, Ross, Fayette and Highland counties was effected. It was determined that each county would raise a sum equivalent to a one-tenth mill levy for the purposes of securing a site and proceeding with the erection of the necessary buildings. On July 7th, the Jackson County Commissioners decided to join the district, thus making a district of six counties.

On May 28th, the Fourth Conference of Ohio Tuberculosis Hospital Superintendents was held at the Lucas County Tuberculosis Hospital. Representatives from a majority of the hospitals in the state were present. Progress was reported by the committee on Rules and Regulations. The next conference will be held in August, probably in Cleveland.

In order to increase the usefulness of the district tuberculosis hospital, the joint board of county commissioners, at a meeting held at Lima, ordered the construction of two new cottages on the hospital grounds. The cost of the new structure was estimated at \$3,000.

The present capacity of the hospital is not sufficient to care for the number of patients. There are thirty-eight men and women at the institution and there are but thirty rooms in the various wards.

Other appropriations, amounting to \$2,100 were made by the joint board. This amount will be used for maintenance. The total appropriation is \$4,000 more than last year. The appropriations will be paid by the five counties interested in the hospital, according to their tax duplicates. The counties are Allen, Van Wert, Auglaize, Mercer and Shelby.

William F. Frey, of Auglaize county, was elected president, succeeding Arthur L. Fisher, of Lima. Harold Mowery, of Lima, was elected secretary, succeeding Harry J. Lawlor, Lima.

Members of the commissioners' boards who attended were: Henry Behrens, of Mercer; L. D. Koch, William Frey and C. H. Dixon, of Auglaize; Enos Huffer, of Allen; William Snow, of Shelby, and H. G. Schumm and George Fissel, of Van Wert; J. L. Heath and W. W. Craig, commissioners-elect of Allen county, also attended.

Prior to the meeting of the board, the trustees held their annual session. Trustees present were: Dr. Oliver Steiner, of Allen; B. C. Coon, of Van Wert; J. D. Johnson, of Celina, president; Prof. C. W. Williamson, of Wapakoneta; and Dr. J. W. Costolo, of Sidney. Members of both boards were guests at dinner of the superintendent, Dr. and Mrs. Davis Johnson.

Ohio's New Prevention of Blindness Law.

For the past twenty-five years laws have appeared on the statute books of various states relative to ophthalmia neonatorum, but few of them seem to have been as effective as their sponsors hoped. Ohio was one of the first states to pass an "ophthalmia law", and once more it is in the front rank in its effort to go one step further in this campaign to save sight, so far as that is possible by legislation.

The American Medical Association recently prepared a model bill looking toward the prevention of unnecessary blindness from ophthalmia neonatorum and suggested that further legislative action should be along the lines of this model bill. The Ohio State Commission for the Blind asked its Advisory Board of Ophthalmologists to adapt this bill to Ohio conditions. This was done and the bill was presented to the 1915 Legislature. The Ohio Public Health Federation endorsed the act and the measure was passed with slight changes.

The great difference between this bill and previous laws is that the definition of "ophthalmia neonatorum" is greatly broadened so

that there will be less likelihood of quibbling over the exact meaning of the term, in fact the first section of the law avoids using the time-honored phrase "ophthalmia neonatorum" and states that "Any inflammation, swelling or redness in either one or both eyes of any infant, either apart from or together with any unnatural discharge from the eye or eyes of such infant, independent of the nature of the infection, if any, occurring any time within two weeks after the birth of such infant, shall be known as 'inflammation of the eyes of the newborn'".

Aside from setting forth this definition of ophthalmia the law is unique in that it undertakes not only to secure reports of infection from all concerned with births, but, according to Sec. 4-4, the State Board of Health is "To provide, if necessary, daily inspection and prompt and gratuitous treatment to any infant whose eyes are infected with inflammation of the eyes, provided further that the state board of health, if necessary, shall defray the expense of such treatment from such sum as may be appropriated for its use." In other words, the state is going to make an attempt to provide nursing service for infants having ophthalmia in families unable to pay for such service.

When it is understood that only \$5,000 has been allowed to defray the expense of this work, it is evident that it will be impossible for the State Department of Health to attempt to cover the whole territory. Nevertheless a start can be made and it is hoped that the State will have the hearty and practical co-operation of all health agencies in putting this measure into effect.

The Ohio Commission for the Blind has at once come forward and offered the State Department of Health the services of its eye nurses in the future campaign to lessen the loss of eyes from ophthalmia neonatorum.

At this writing, no attempt will be made to give the exact details for the operation of the law, except to say that it is the expectation of the State Department of Health, in co-operation with the Ohio Commission for the Blind, to district the state so that there will be eight "eye nurses" ready to respond to telegraph calls for assistance in ophthalmia neonatorum cases. In a subsequent issue, further details about the operation of this law will be given. The State Department of Health and Ohio Commission for the Blind are most anxious that the medical profession shall understand that, in the effort to stamp out the unnecessary loss of sight from this cause, there will be the heartiest possible co-operation between these two state boards and that similar co-operation is expected from the doctors.

Legislation.

Bills of interest to public health and social workers, which have been enacted into law during the session of the Eighty-first General Assembly of Ohio, are as follows:

H. B. No. 61. Mr. Deaton, Jan. 19. — Permitting probate court to issue marriage license to persons under legal age who have no guardian.

H. B. No. 94. Mr. Walsh, Jan. 19. — To provide for admission of feeble-minded youths to state institutions.

H. B. No. 121. Mr. Hoy, Jan. 21. — Authorizing the state board of health to produce free diphtheria antitoxin.

H. B. No. 142. — Mr. Hoy, Jan. 25. — To bar undesirables from the practice of medicine.

H. B. No. 150. Mr. Black, Jan. 25. — Transferring control of the women's reformatory at Marysville from the building commission to the state board of administration.

H. B. No. 154. Mr. Morris, of Fairfield, Jan. 26. — Providing new conditions for entrance to Mt. Vernon tuberculosis sanatorium.

H. B. No. 203. Mr. Chapman, Feb. 1. — Providing county commissioners may maintain comfort stations on county property.

H. B. No. 218. Mr. Whitacre, Feb. 1. — Appropriates \$5,000 for extending system of free employment agencies.

Sub. H. B. No. 220. Mr. Platt, Feb. 3. — To authorize and regulate the practice of chiropractic.

H. B. No. 249. Mr. Cowan, Feb. 3. — Relating to the admission of persons to state institutions.

H. B. No. 321. Mr. Beetham, Feb. 16. — Making it unlawful for any person to falsely represent himself or herself as blind, deaf, dumb, crippled.

H. B. No. 323. Mr. Sprague, Feb. 16. — To regulate the practice of nursing.

H. B. No. 376. Mr. White, Mar. 1. — To provide for the control of the educational requirements and the registration of pharmacists.

H. B. No. 470. Mr. Deaton, Mar. 10. — For the prevention of blindness from inflammation in the eyes of the new born.

H. B. No. 627. Mr. Klein, Apr. 9. — Substitute for bill vetoed by governor providing for permitting prisoners to be given benefit of conference with attorneys.

H. B. No. 660, Mr. Harding, April 19. — To provide for a city planning commission on municipalities.

H. B. No. 665, Mr. Sprague, April 20. — Relating to tuberculosis hospitals.

H. B. No. 712. Mr. Platt, May 13. — Relating to the state building code.

S. B. No. 3. Mr. Moore, Jan. 16. — Relating to the civil service of the state of Ohio, counties, cities, and city school districts thereof.

Sub. S. B. No. 7. Mr. Lloyd, Jan. 18. — Providing for the regulation and licensing of the loaning of money without security or upon personal property.

S. B. No. 60. Mr. Bauer, Feb. 2. — Defining delinquent and dependent child.

S. B. No. 84. Mr. Lloyd, Feb. 9. — Relating to the annual salaries of appointive state officers and employes.

S. B. No. 280. Mr. Stone, April 12. — Providing that public schools shall be free to inmates of private orphan asylums and children's homes.

S. B. No. 322. Mr. Fellinger, May 27. — Relating to the procuring of funds to comply with orders of the state board of health.

Prosecutions.

The Cincinnati Board of Health has been particularly active in enforcing the regulation of the State Board of Health relating to the use of common drinking cups and roller towels. Two cases were successfully prosecuted in the municipal court during the month of May. Both cases were against saloonkeepers who kept roller towels hanging at their public washstands.



CURRENT COMMENT ON MATTERS OF PUBLIC HEALTH AND SANITATION.

Standards of Ventilation in the Light of Recent Research.

The fact that the stagnant air of an occupied room becomes uncomfortable and makes those who are exposed to it listless and inert is a matter of common experience. Over-crowding in a close space may even be fatal, as in the Black Hole of Calcutta, the underground prison at Austerlitz and the hold of the ship *Londonderry*. Conversely, fresh air in the treatment of tuberculosis, and other diseases, is one of the fundamentals of medical and hygienic practice.

It was formerly thought that the evil effects of air in occupied rooms was due to a specific human poison called anthroptoxin, a hypothetical substance. The concentration of this was thought to be measureable through the amount of carbon dioxide present and hence it became the practice to make carbon dioxide examinations.

However, as early as 1863, Pettenkofer showed clearly that carbon dioxide in itself is quite without effect in the highest concentrations which it ever attains in occupied rooms. The researches of Flügge, Haldane, Hill, Benedict and others, show beyond any reasonable doubt that the effects experienced in a badly ventilated room are due to the heat and moisture, rather than to the carbon dioxide and other substances given off in the breath. As Prof. F. S. Lee has so well expressed it, the problem of ventilation is not chemical, but physical—not respiratory, but cutaneous. Persons may be provided with outside air and yet suffer great discomfort if the body be exposed to abnormal heat and moisture; and they may be quite completely relieved without changing the surrounding air, except to cool it, and especially if this is done with the help of an electric fan to put it in motion.

Undue heat and moisture (86° with 80 per cent relative humidity) do not appear to affect respiration, digestion or skin sensitivity, but on the other hand it greatly affects circulation and the heat regulating machinery of the body, and even a slight increase in room temperature readily affects both of these so that the pulse is quickened and the body temperature raised. In addition the systolic blood pressure is slightly decreased in a hot room and the *Crampton value* is markedly decreased (this is the rise of blood pressure and pulse rate on changing the position of the body from a horizontal to a vertical posture—a test of physical fitness).

Psychological tests all fail to show any effect in hot rooms, although initiative, or option tests show a distinct lessening. The results of physical work show that the subjects accomplish 37 per cent more work at 68° than at 86°.

Experiments are now under way in regard to the influence of over-heated rooms and dry atmosphere.

As to the effect of stagnant breathed air contaminated by a group of subjects so as to contain up to as high as 60 parts of carbon dioxide per 10,000 (the normal is 4 parts per 10,000), the observations were entirely negative. So long as the room temperature was the same it seemed to make not the slightest difference whether the air was stagnant or was renewed at the rate of 45 cu. ft. per minute per capita, *except* that failure to ventilate, or to cause circulation in the air, rapidly tended to increase the temperature. In crowded auditoria every bit of the 2,000 cu. ft. of air per hour for each person is needed, and in many industrial processes, where the heat produced by human beings, gas flames, illuminants, friction of machinery, the heat from solder pots, furnaces, mangles, pressing irons and a host of other sources, even more will be required.

Again it was noted that while all ordinary physiological and psychological tests failed to show any effect due to stagnant air as long as the temperature was maintained the same, there became noticeable, in a long series of experiments, an effect upon the appetite and hence the general health, as shown by the decreased amount of food which was consumed under such conditions.

Occupied rooms should be kept clear from noticeable odors and the odors in an occupied room may be taken as a rough measure of the efficiency of ventilation.

The thermometer is the first essential in estimating the success of ventilation. A rise above 70° must be recognized as a sign that discomfort is being produced and efficiency decreased and vitality lowered. The mechanical standard of 30 cu. ft. of air per minute per capita to maintain an occupied room clear and fresh, is of general application.

It is a foolish empiricism which maintains that out-door air as Nature makes it is necessarily the final word in air conditioning. The task of applied science is to find out the best elements in a natural environment and to select the good without the bad. — Abst. "*Science*" 1915.

Some Engineering Problems in Ventilation.

The sanitarian formerly told us that carbon dioxide was a poison, that insufficient ventilation meant insufficient oxygen for breathing purposes and that we were endangered by "crowd poison" when in a mass of people. But little was said of temperature, less of humidity and nothing of air movement. We all believed that the chemistry of the air was vital.

The effect of excessive temperatures and humidities is especially well understood, as is the demand for constant air movement for the elimination of bodily heat and moisture. Less is scientifically known of the effect of cold and the effect of low humidities. The solution of these two problems is of vast importance.

Yet air quality (chemistry) has still some importance. The New York State Commission on Ventilation in its experiments, found that stagnant air decreased the appetite of the subjects 13 per cent and there are further determinations of the importance of air quality which must be solved by extended experimentation.

Improvements in ventilation now include the individual duct ventilating system, providing air in the volumes and of the exact temperature required by each individual room under varying weather and other conditions. Greater attention is paid to the diffusion of the ventilating air and to the character of the installation and materials used and the emphasis upon intelligent operation of the plant. Noisy heating, however, is considered a thing of the past, for noise is indicative only of lack of skill in design or installation.

The present day mechanical fan has an efficiency of 65 per cent. and results in saving more than 30 per cent. of the power formerly expended for ventilation.

Possibly the most interesting, important and valuable recent addition to the ventilating plant is that of the air washer. Briefly, the air is passed through a heavy mist in a sheet metal chamber and through baffles which remove the excessive moisture. The same water is used over and over again for this purpose. As much as 98 per cent. of the dust in the air is removed, but there is always a residue of dust which no washer will remove.

By the use of thermostatic devices an accurate control of the degree of humidification is obtained. The air washer is also used for cooling. The evaporation of the water in the spray chamber will result in a lowering of the temperature of the air to extent of 75 per cent. or more of the difference between the wet and dry bulb tempera-

tures, often amounting to 10 to 15 degrees and even to 20 degrees on the thermometer. A greater degree of cooling may be accomplished by a continual supply of cold water, which if purchased from the city mains would be expensive, but if pumped from an artesian well the cost is small. Finally, where a constant cooling effect is desired, the use of a refrigerating plant in combination with the washer is necessary. The water tank is then increased in size and brine or ammonia coils are installed. Unfortunately such plants are expensive to install; with exhaust steam for use in an absorption refrigerating machine, etc., the cost of operation is slight. Otherwise it may be roughly stated that the cost of cooling 10° during the summer is approximately equal to heating 70° during the winter.

For ordinary ventilation work cooling at the expense of increased humidity necessitates the dehumidification which is an expensive part of the process.

The use of the air washer has become almost indispensable to many industries, such as textile manufacturing, candy, macaroni, photographic and film making and in some processes of paper, tobacco, chemical, steel and plumbing fixture manufacturing.

The conclusion was reached that there seemed to be no appreciable difference between washed recirculated air and outdoor air similarly treated so far as bodily comfort is concerned. Naturally the proportion of carbon dioxide is greater when using the recirculated air, but no significance is attached to this fact.

Studies in the winter of 1913-14 appear to show that recirculated air was equally as satisfactory as outdoor air. Window ventilation failed to give satisfaction.

Air washing is not sufficient to remove all odors, but they are reduced to such an extent that they are not offensive to persons occupying the room continuously, although noticeable to persons entering the room.

It is manifest that a large amount of heat is saved, and this certainly warrants the most careful study of the problem of recirculation. Should it prove in every way satisfactory a great step in advance will have been made in the field of mechanical ventilation. But it may not be recommended as yet.—*Abst. Science*, 1915.

To Regulate the Practice of Nursing.

The Commissioner of Health of New York City has considered the necessity of amending the "sanitary code" in order to provide for stricter regulations intended to insure better nursing care for the sick.

His purpose is based upon his observation that directories and other agencies are furnishing to employers non-graduates and many poorly equipped nurses, even when the employer has requested and thinks he is obtaining a graduate. The amendment which he would have adopted reads as follows:

"No person other than one who shall have graduated after a course of training of not less than two years' duration from a hospital training school for nurses shall practice as or hold himself or herself out to be or be by any one held out or represented to be a trained, graduate, or certified nurse, or use any letters, words or figures to indicate that such a person is a trained, graduate or certified nurse."

Nurses who have long and strenuously advocated registration by the state must feel justified for their efforts in having their theory supported by so great a personage as the Health Commissioner of New York City.—Abst. *The Modern Hospital*, 1915.

Climate and Consumption.

Climate in itself has very little to do with the cure of consumption. It is generally believed by consumptives, however, that certain climates have all that is necessary for a cure and that all they need is to go there. Frequently in making the trip—a long distance, perhaps more than half across the continent—they use up their strength and a greater part of their means, and have nothing with which to employ medical attendance or the nurse care they need after arriving. In fact, more than half of the people who leave their homes for these resort regions would have been better off, more comfortable, more contented, and would have had a better chance to live, had they stayed at home.

The facts in the case are more or less these. The chances of cure in resort climates may not be so great, but even these should be given fair tests. Lack of means that forbid the services of equipped physicians and nurses, restlessness and discontent, are serious handicaps which more than offset the advantages to be derived from the climate. Accidents and inconveniences in traveling should be taken into consideration, but more than these, the stage of the disease should be considered. The advanced case should by no means leave home to seek a cure in distant parts of the country.

What one should do, however, is to go early to some sanatorium and there put himself into the hands of physicians and nurses. In other words, he should seek the cure in some nearby sanatorium rather than in some far away climate. He should spend his money to have

good nursing and a physician's care rather than in a wild goose chase on the railroad.

How Fresh Air Cures Tuberculosis.

A patient in a tuberculosis sanatorium writes to the State Department of Health to ask "What is the effect of fresh air upon the germ of tuberculosis in the lungs?"

Reply.—There is probably no direct effect of fresh air upon the tubercle bacillus in the lungs. The fresh air affects the patient and makes it easier for him to fight off the disease.

The healthy human body has its "fighting edge," which enables it to hold its own against the tubercle bacillus if it is given a chance. Great numbers of people become infected with tubercle germs who do not develop actual disease because the germs cannot gain any foothold. It is the people who live in overheated rooms and breathe the air of dusty factories and get too little food and sleep who fall victims to tuberculosis. Dissipation and attacks of other diseases also prepare the way for it.

Life in the open under medical advice, breathing fresh, cool air and surrounding the body with fresh, cool air—these things somehow stimulate the system to resist the invading germ, build up its vital resistance, so that the patient who has just begun to develop tuberculosis succeeds in overcoming the germ and at last gets well.

In every case of tuberculosis and in most other diseases as well there are two sides, as there are said to be to a quarrel. It is just as important to strengthen the body as to weaken the germ, and this is what fresh air does. Indeed, we cannot by medicine or in any other way attack the germs of tuberculosis.

Kentucky's First County Hospital.

From a list of thirty nominations, a board of trustees was appointed recently for the County Tuberculosis Hospital to be erected near Hopkinsville, Ky., which was provided for by a referendum vote last fall. This is the first county hospital to be provided for in Kentucky, and marks a significant step in advance. Under the law, it will be the duty of the board to select the site for the proposed hospital in co-operation with the State Tuberculosis Commission, to supervise its construction and to provide for its maintenance out of appropriations made therefore by the fiscal court. An appropriation sufficient to purchase the site will be available from this year's tax levy in December.—Abst. *The Modern Hospital*, 1915.

Unique Tuberculosis Hospital.

Plans for a tuberculosis hospital to be erected by the city of Detroit at a cost of \$400,000 call for an eight-story building to accommodate three hundred and forty-five patients. The center will be of solid brick construction, but the sides will consist largely of steel sash, so that practically the entire building can be opened to the air. According to the general scheme of the hospital, patients in advanced stages will be housed in the second and third floors. To the end that there can be a gradual weeding out of patients as their condition becomes worse, so other patients will be spared seeing them, the wards in which serious cases are placed will be of decreasing size. A patient in the final stages will occupy a private room. Incipient cases will be cared for on the fourth and fifth floors, where a process of elimination will be followed. Cases that will soon be discharged will be cared for on a large porch on the sixth floor.—Abst. *The Modern Hospital*, 1915.

The Chemotherapy of Tuberculosis.

The failure of chemotherapy in tuberculosis is due largely to the fact that the tubercle has very few blood vessels and a very scant blood supply. For this reason chemical agents can not gain access to the foci of infection and all remedies fail to effect a cure. Another reason for the failure of chemical agents is the impermeability of the fatty capsule which surrounds the tubercle bacillus. Iodides and fat solvents were tried hoping to dissolve this capsule but none were successful. It was found that by feeding guinea pigs various dyes such as trypan blue, trypan red, methylene blue, etc., the tubercle bacillus could be stained. Methylene blue is known to have some bactericidal properties but produces no beneficial results when used as a therapeutic agent. The efficiency of the copper compounds was also investigated but it was found that crystalline compounds of copper were changed into the colloidal forms as soon as they were administered. Several investigators have been able to prove that these colloids are unable to gain access to the tubercle and for this reason the copper compounds are worthless as remedial agents.

All results in the chemotherapy of tuberculosis have been discouraging but it is hoped that further investigations will meet with more success.—Abst. *Medical Record*, 1915.

The Tuberculosis Preventorium for Children.

The fact that tuberculosis is largely contracted in infancy has now become generally accepted. It has naturally changed our views as to the measures of prevention. Dr. Alfred F. Hess has urged the necessity of segregating infants born of tuberculous mothers. In the Farmingdale Tuberculosis Preventorium for Children, the necessity of this step has been realized. At this institution, having a normal capacity for 180 children, provision has been made for the reception of infants under one year of age. The preventorium is associated with the many tuberculosis clinics in New York. The treatment given is simple and consists mainly of good food, a twenty-four hour day in the open air and an intimate acquaintanceship with the woods and fields. Every six months after release the children are visited in their homes, and their physical condition and environment noted. All the tuberculosis clinics which act as admitting offices to the institution are under one general direction. Such institutions should be provided for in every large city, for surely here is one of the best means of doing preventive work in tuberculosis.—Abst. *Medical Record*, 1915.

Developments in Scarletina Therapy.

Two new methods of treating severe cases of scarlatina have been developed within the last few years. One of these methods is the use of salvarsan or neosalvarsan. The other is the injection of blood serum of convalescent scarlet fever patients.

The first experiments with salvarsan, in 1910, were not successful. T. Peonsen, who made most recent investigations, reports 35 cases in which salvarsan was injected intravenously in 30 cases, giving good results in 10 cases, negative results in 15 cases, and doubtful results in 5 cases. Neosalvarsan was injected in the remaining 5 cases but the results were unsatisfactory. It is certain that the use of salvarsan saved many of the severe cases and no unfavorable action of the drug could be noted in any instance.

Complications were neither ameliorated nor prevented, but this is thought to be due to the fact that complications are usually due to the action of streptococci which are not affected by salvarsan.

These results show that salvarsan is of great value in severe cases, yet it is not a specific against scarlet fever.

Reiss and Jungmann reported 12 cases in which favorable results were obtained by the use of blood serum of convalescent patients. R. Koch reports similar results in a series of 22 severe cases of scarlet

fever treated in the same manner. Only one death occurred and in that instance the patient was already moribund. Even in the late stages and in the septic type a favorable influence follows the treatment.

The favorable results obtained by both forms of treatment justify further investigation of their use in treating scarlet fever.—*Abst. Medical Record*, 1915.

The Extent and Spread of Rocky Mountain Spotted Fever.

A recent report of the U. S. Public Health Service shows that Rocky Mountain Spotted Fever is present in nine western states. Investigators have proven that the disease is transmitted by the bite of infective wood ticks which are common in these localities. There are certain areas in which the disease has been prevalent since it was first recognized and there is no evidence to show that it has recently spread into new territory.

A study of the habits of the ticks shows that they remain close to the place where they are hatched. The animals which are susceptible to this infection do not travel far and since the disease runs its course in about two weeks the danger of wide-spread infection is greatly reduced. However it is thought that the presence of the disease along some of the western streams is due to the adult ticks carried by deer, elk, buffalo and cattle. The fact that infected ticks can be carried in this manner shows how infection may be spread when these animals are shipped to other localities.

It has been found that eastern ticks are capable of transmitting Rocky Mountain Spotted Fever experimentally and it is possible that a foci of infection would be established if an infected animal were brought to a tick infested eastern community. For these reasons physicians practicing in localities where patients have been exposed to tick bites should watch suspicious cases especially during the spring and early summer.

The investigation by the U. S. Public Health Service shows that sheep grazing is the most efficient means of tick eradication. The sheep keep down the undergrowth in which the ticks are found and also destroy many adult ticks. During a recent experiment it was estimated that 1500 sheep destroyed 25,000 adult ticks.—*Abst. J. A. M. A.*, 1915.

Control of Malaria.

Proper drainage is recognized as the most efficient means of preventing the multiplication of mosquitoes. Where drainage is impracticable the use of oil on stagnant pools is a good supplementary mea-

sure. To obtain good results from the use of oil the entire surface of the water must be covered with a film of oil. This film of oil prevents adult mosquitoes from laying eggs on the water, and also kills the larvae which rise to the surface for air. The larvae of mosquitoes are not found in deep water except along the banks or around aquatic plants or debris. The use of oil upon ditches, pools, and small streams has given very satisfactory results and when properly applied is an efficient measure in preventing the spread of malaria.—*Abst. Medical Record*, 1915.

Kaolin in the Treatment of Bacteria Carriers.

Kaolin has been variously employed as a therapeutic agent since 1906. It has been employed for the treatment of Asiatic Cholera, septic wounds, as a gastric astringent and in cholera and dysentery. According to some authors Kaolin has been effective in almost instantly stopping of diarrhea in dysentery and typhoid. Recently this earth has been employed in the treatment of typhoid carriers. Von Willuki has used it in two cases of paratyphoid bacteria carriers. In both cases the organisms quickly disappeared from the stools. Hektoen and Rappaport have tried insufflations of Kaolin powder in the nose for the removal of bacteria from the nose and throat. They have been successful with the diphtheria organism as well as streptococci. Kaolin may thus settle the vexed question as to the proper treatment of diphtheria carriers.—*Abst. J. A. M. A.*, 1915.

Study of a Recent Typhoid Epidemic With Especial Reference to the Use of Anti-Typhoid Vaccines.

Investigators are undecided in regard to the advisability of giving typhoid vaccine to persons who are presumably infected.

An epidemic of typhoid fever among the staff and employees of the St. Louis City Hospital gave a good opportunity to test the value of vaccine, and Dr. Warren P. Elmer made a written report of his results together with brief histories of twelve cases.

The infection was traced to the kitchen and dining room and about two hundred and fifty persons, including physicians, nurses, and employees, were exposed to infection. Out of this number forty-three cases of typhoid developed. One or more injections of vaccine were given to twenty of these patients. The histories of the more important of these twenty cases were included in the physician's report, but since the results are similar in all instances the report is summarized in the following conclusion.

1. The use of anti-typhoid vaccine in persons who are infected does not increase the number of those who develop the disease.
2. An injection of vaccine directly preceding or during the period of incubation does not produce immunity.
3. The use of vaccine immediately preceding the onset does not modify the course of the disease.
4. "The advisability of giving anti-typhoid vaccine to those presumably infected seems questionable and may in a few instances precipitate an attack." — *Abs. J. A. M. A.*, 1915.

Age Distribution of Typhoid Fever.

The United States Public Health Service has published statistics based on about 16,000 cases of typhoid fever in the states of Minnesota, Pennsylvania and Michigan, which show that the disease is more prevalent among persons in the age group "20 to 24 years". The following table shows the age distribution of the cases reported in 1913 in these three states.

<i>Ages of patients in years.</i>	<i>Number of cases reported.</i>	<i>Ages of patients in years.</i>	<i>Number of cases reported.</i>
Under 5	620	45 to 49.....	386
5 to 9.....	1,907	50 to 54.....	294
10 to 14.....	1,826	55 to 59.....	173
15 to 19.....	2,153	60 and over.....	211
20 to 24.....	2,291		
25 to 29.....	1,533	Total	13,826
30 to 34.....	1,088	Age not stated.....	238
35 to 39.....	777		
40 to 44.....	577	Total cases	14,074

In order to determine more accurately the relative susceptibility at different ages, a ratio was approximated to the estimated number of persons at each age group. The result shows that the age period 20 to 24 is not only the period in which the greatest number of cases occur, but it is the age of greatest relative incidence. The rate of incidence at this age is, however, only slightly greater than that in the age group 15 to 19. The ratio of incidence falls rapidly at the age groups 25 and over, from a maximum of 23.5 to 4.5 at ages 50 and over. *Abst. Public Health Reports*, 1915.

The Abortion of Typhoid Fever.

Dr. Wm. L. Frazier, the medical director of the Frazier laboratory, has been successful in aborting typhoid fever by the use of ipecac given in salol-coated capsules. Since the action and dosage of the ipecac is rather uncertain he has made further investigations by using the action principle, emetine hydrochloride, hypodermically. By hypodermic administrations exact doses can be given and nausea is not produced.

In a series of 82 cases, treated by this method, only six showed an elevation of temperature for more than four days after the treatment was begun, and in these six cases the fever lasted less than six days. In three of the six cases mentioned the treatment was not begun until the third week and in the other three cases the drug used was found to be below the standard.

It has been found by tests that typhoid organisms will not grow in the serum of a goat which had previously been injected with three half-grain doses of emetine. Colonies of bacilli planted on this serum died within ten hours.

When emetine hydrochloride is injected subcutaneously it enters the blood and forms a medium in which typhoid organisms can not grow and in this way destroys all bacilli in the blood. During the first two weeks of a typhoid infection most of the infecting organisms are found in the blood stream and for this reason it is necessary that the emetine be administered early if any benefit is to be derived from its use. After the first two weeks the bacilli are established in the intestinal lymph follicles and the action of the drug is slower and much impeded. For the average adult the dose should be $\frac{1}{2}$ grain of emetine hydrochloride, repeated every 6, 8, or 12 hours, depending upon the range of the temperature and the condition of the patient.

There is no reaction except a fall in the temperature which may be even subnormal for a short time. Dr. Frazier has two case histories showing temperature and dosage and has selected these two cases as being typical of the 82 cases in which the abortive treatment was used.—Abst. *Medical Record*, 1915.

Women and Eugenics.

The willingness to subordinate personal inclinations and ambitions in behalf of children unborn represents intellectual progress. It is important that women realize that the choice of a husband is a fundamental eugenic problem. The introduction of pre-marital health

certificates lies within the power of women when they are prepared to demand such certificates of health for themselves and their children.

What type of parent would a child select for itself? It is not possible to single out any particular type that should characterize the future generation, nor to develop such a type from the stock now existent in the world. Eugenic development is not possible along the lines that are satisfactory for the breeding of animals.

While it is true that many physical, mental, and moral characteristics are transmitted from parents to offspring, judgment must not be warped by statistics indicating the large proportion of people who are said to be undesirable for marriage. If all the recommendations of types for which marriages should be interdicted were to be accepted, there would be few persons left to reproduce society.

The small fraction of a per cent of the population stigmatized as degenerate must not dull our senses. The hope of the future rests on the great mass of people whose physical, mental, and moral life apparently tends to improve according to some undiscovered laws.

The participation of women in eugenic progress embraces active participation in every phase of social progress. It involves and demands the direct and indirect influence within the home, the neighborhood, the community, the state and the nation. It encompasses the entire sphere of environment as well as the more personal question of marriage and its attendant problems.

The leaders in the philosophic expansion of eugenic ideals might well be the women who have found themselves in medicine. Their special training, education, and understanding of the problems of life should enable them to assist others to grasp the relation of their own activity to the welfare of future generations. Among all the practical workers in the field of eugenics none has a greater potential power than the earnest, honest, intelligent, educated woman physician. *Abst. — Medical Review of Reviews, 1915.*

Health and Education.

Health and education should go hand in hand and on the same plane; but while millions are devoted to education, only thousands are spared for health. A hundred millions are spent by New York State on a barge canal; another hundred millions on good roads; tens of millions on institutions for the care of mental and physical derelicts, while a few hundred thousands only, are devoted to the promotion of health. This is not said in criticism of these larger expenditures, but to emphasize the newly recognized necessity which the welfare of every citizen involves.—*Abst, Health News, 1915.*

The Reporting and Control of Venereal Diseases.

Some efforts have been made to control venereal disease since ancient times, but not until the middle of the eighteenth century were any systematic attempts made to prevent venereal infection. The method most used in Europe has been that of registration and regular examination of prostitutes. It is evident that this system is of little value without complete registration, and its complete failure is shown by the statements of Flexner, that out of a total of 50,000 to 60,000 prostitutes in Paris, but 6,000 are registered, with about the same proportion in other great cities. This system, too, entirely ignores the spread of infection by men.

Sanitary officials agree that no distinction should be drawn between venereal and other infectious diseases. The New York City Health Department has, therefore, undertaken active measures for the control of these diseases. All venereal infections were made reportable in May 1912, these reports being considered confidential and facilities were provided for bacteriological and serological diagnosis, these facilities to be extended only where complete data for registration are furnished. Opposition was encountered, but this is gradually disappearing.

The Health Department laboratories perform free of cost the Wassermann reaction and complement fixation test for gonorrhea, examine smears for treponema and gonococci and make cultural examinations of urinary sediments and urethral discharges. In 1914, 57,724 specimens were examined, 42,515 Wasserman tests, 9,441 complement fixation tests and 5,868 smears. The total number of cases reported for 1914 is syphilis 21,155, gonorrhoea 9,526, chancre 517. Three diagnostic clinics have been established, also an advisory clinic which is used as a sort of clearing house. Free advice is given regarding the nature and cure and the danger of consulting quacks. Educational pamphlets are issued and the department runs advertisements in newspapers telling of the free clinics and warning against the advertising quacks. The educational propaganda is an important feature of the work. It is necessary to overcome the prejudice of centuries against any discussion of these matters. As Dr. Morrow says "To all we must speak plainly, but sanely, clearly but cleanly, scientifically but simply."—*Abst. The American Journal of Public Health*, 1915.

Philippine Government Creates Sanitary Corps.

A new Philippine health law, creating a service similar in organization to that of the United States Public Health Service, becomes effective July 1. This legislation provides for a health body, which will have supervision over all matters of sanitation in the Philippine Islands. Probably no greater compliment has ever been paid the U. S. Public Health Service than that of modeling after it the Philippine organization.

The service as contemplated is to consist of a director and assistant, chiefs of divisions, medical inspectors, and senior and junior surgeons. These officers are to be commissioned by the Philippine government, are to hold office during good behavior, and cannot be dismissed without cause. In other words they will be independent in action and entirely free from political influences. All appointments and promotions are subject to physical and profession examinations, and salaries are regulated by length of service.

The administration of the health laws of the respective provinces and all medical, surgical and sanitary work of a public nature, will be supervised by this body. The director of health is to be appointed by the Governor General, the present incumbent, Surgeon John D. Long of the United States Public Health Service, being retained. An advisory council of hygiene is provided, to consist of seven representative members, appointed largely from educational institutions. The salaries of the members are to be merely nominal. Sanitary engineers and technical experts will be employed. For the purposes of administration the provinces are divided into sanitary divisions which may be composed of several municipalities.

Funds for health purposes are to be raised in a most novel manner. Provincial boards and municipalities are required to set aside not less than 5 per cent nor more than 10 per cent from their general funds, these amounts to be devoted to sanitation and carrying out the purposes of the act. Balances which accumulate from year to year are to be used for establishing hospitals and benevolent institutions. This forever prevents a niggardly policy in making health appropriations and places the man before the dollar for all time.

The administration of the law will be observed with much interest by officials in this country. The powers conferred greatly exceed those possessed by our own health organizations, and jurisdiction is extended over all matters which have a definite bearing upon physical welfare.

Co-operation and Co-ordination of Voluntary Public Health Organizations.

The epoch-making change in our knowledge of disease has been so often stated as to be commonplace. Yet the change which such process has made and will make in professional and social conditions, is only beginning to be appreciated. Until the latter half of the last century, except for the discovery of vaccination, the human race has been without knowledge or ability by which it could control, to say nothing of preventing, epidemics which for ages had scourged and decimated mankind. The historian of future generations will regard the 19th century as noteworthy, because of those discoveries by which health and long life have become purchasable commodities, which mankind can buy in the same way that he buys food and clothing. It has not yet even penetrated the popular mind and I doubt whether its enormous economic and social importance and possibilities have as yet been fully realized by any one.

The prevention of disease and the conservation of human life is clearly too great a task for individual effort. Some form of social machinery is an obvious necessity. If our conceptions of present conditions and future possibilities are vague, it is not strange that the organizations and methods by which this knowledge is to be utilized should be equally vague, largely accidental in origin and based on temporary needs and considerations rather than on any broad principles or critical analyses of the situation.

Public opinion is the basis of effective legislation. Hence the creation of public opinion is necessarily the first step in any movement. The object of the organizations under discussion is the stimulating and crystallizing of public opinion, with a view to securing the adoption of corrective or restrictive measures. If educated public opinion is necessary in securing ordinary reforms, it is still more so in the public health field. The causes of disease are microscopic and therefore invisible to the eye. The average man and woman must accept on faith the existence of causes invisible to them. This renders public education all the more necessary. It also emphasizes the responsibility of the state and its duty in protecting its citizens from dangers which they themselves cannot recognize. The objects of the organization of these voluntary bodies are: first, to stimulate scientific study of the public health field; and second, to educate and stimulate public sentiment with a view to securing better conditions through the force of public opinion or through the passage of appropriate legislation.

We have divided the public health field up into so many portions that one must practically be a specialist or have special interests in order to find a place. There is no provision for the ordinary citizen. Not only is support divided, but influence is likewise weakened. Such public sentiment as exists is divided among so many interests as to lack the force which a single united body would have. To expect the public in a single state or a single city to support half a dozen or more special organizations is entirely out of the question. The purpose of all of them is the same,—the prevention of disease, but they have no common plan of campaign, nor any method by which such a common plan can be devised and executed. Such a conditions can only mean overlapping, duplication, waste effort and lack of efficiency. There exists, then, today an indefinite number of unco-ordinated, unrelated organizations which have originated accidentally rather than in conformity to any plan, which do not provide a place for the general public, which are organized on lines that are necessarily self-limiting and which are financed on a system which is highly expensive in proportion to the results secured. They are at present confusing quite as much as they are educating the newspapers and public opinion.

The time has come for the creation of a united, coherent, and effectively organized public health body to take the place of, or at least to co-ordinate, the independent, accidental and uncorrelated organizations which have so far occupied the field. If anything definite is accomplished in public health reform, it must be through the education of the average man and woman rather than through the efforts of the physician, the specialist, or the sociologist. These must indeed act as leaders and furnish the necessary technical information and experience on which successful efforts must rest, but the rank and file of the public health army must be drawn from the public. An ideal organization would be one without limitations as to subject which any man or woman who desired could join by the payment of a nominal membership fee. A national organization made up of, and supported by, subordinate state organizations which are in turn composed of local branches, is the logical method in this country. Such a body could logically take up the much discussed question of the publication of a popular journal or magazine on public health. All the conditions point to the American Public Health Association as the one best fitted to fulfill this mission. Is it not possible for your association to become in fact, as well as name, a national public health association for the co-ordination of all of our voluntary public health activities? — *Abst. The American Journal of Public Health*, 1915.

Good Teeth Essential to Good Health.

According to the United State Public Health Service there will be a falling off in the sale of store teeth in the future, and plates and toothless gums will be seen less frequently than formerly. This is due to the epoch-making discovery of the cause and method of treating what is known to the scientist as pyorrhea dentalis and alveolaris and to the layman as Riggs' disease. This is a suppuration around the roots of the teeth and causes an inflammation which produces loosening and loss of the teeth. At one time or another practically everybody has Riggs' disease. It is caused by a minute single-celled animal called the endamoeba buccalis. This malevolent parasite does its work in combination with the pus-producing bacteria or germs. The skillful teamwork between these two destroys the delicate membrane which surrounds the roots of the teeth and causes them to fall out.

The necessity of good teeth in order to have good health has been recognized a long time, but the scientists of our country have only recently worked out the relationship between decay of the teeth and Riggs' disease on the one hand, and rheumatism, serious heart disease and high blood pressure on the other. So firmly have these facts been proven that the modern up-to-date physician begins the treatment of such diseases by an inquiry into the condition of the teeth and their sockets. If these are found to be diseased, the condition is cured before the treatment goes further. The discovery of the cause of Riggs' disease is, therefore, of the very greatest importance.

Just as soon as the cause of Riggs' disease was found out, the search for the cure began in earnest. It had been previously discovered that the use of ipecac would cure the diseases which are caused by infection of the intestine with endamoebae. From this it was deduced that a similar treatment would cause the destruction of endamoebae in the mouth. This was found to be the case, and emetin, the form of the drug used, is now administered by physicians for the cure and prevention of the disease. It sometimes takes a considerable time to get rid of all of the malignant germs in this way but the results which have been obtained have been remarkably good. The treatment is both local and general.

In the matter of preventing mouth disease, it is important that the mouth be cleaned several times a day, and that a dentist be visited frequently to remove tartar and the yellowish matter which accumulates along the inner edges of the teeth and between the teeth. This

is particularly important in the case of children, because it has been found that many a child is apparently dull who is in reality suffering from a chronic poisoning produced by a mouth full of decaying teeth.

The number of sufferers from Riggs' disease in the United States is very large and the United States Public Health Service is daily receiving inquiries as to the method of curing and preventing the disease.

Good Water for Farm Homes.

Clear, sparkling water is not always pure water. A refreshing draught from "the old oaken bucket" may be the beginning of a long and possibly fatal illness from typhoid fever, dysentery, cholera or other disease.

The subject of pure water supplies for drinking and cooking purposes is discussed in a bulletin just issued by the United States Public Health Service under the title "Good Water for Farm Homes."

The germs of the so-called water-borne diseases come from the bodies of persons afflicted with those diseases. They do not live long outside the body and do not originate spontaneously in nature. A few diseases are communicated from animals to man, but for the most part the germs which get into drinking water and produce disease, come only from human beings. If we keep the waste products from the bodies of human beings and animals away from our water supplies, we keep the water free from disease germs.

The usual sources of farm water supplies are wells, springs and cisterns. Running streams are so seldom free from dangerous pollution that without purification they cannot often be considered safe for domestic use.

The most common form of supply is the shallow well, reaching into a layer of earth saturated with water. Few of these are fed by flowing streams, except in limestone formations, and they are really little more than reservoirs for "surface water." Since they drain the surface for a radius of sometimes several hundred feet, their location with reference to stables, out-houses and stock pens is a matter of prime importance. Other possible sources of pollution are a leaky or loose well casing, a defective curb, or a cover that is not water-tight. The best methods of constructing such wells and protecting their contents are set forth in this bulletin of the Public Health Service.

Artesian wells, driven wells, cisterns and natural springs are also discussed in this publication, and safe-guards against pollution pre-

scribed. It is sometimes impossible to secure pure water for drinking and cooking, and methods of purification must be adopted. It should be borne in mind also that once a safe supply is obtained, its purity is insured only by the continued observance of the principles of common sense and common cleanliness. These are neither difficult nor expensive.

Fourth of July Tetanus.

The American people have reason to congratulate themselves over at least one achievement, and that is the rapid disappearance of Fourth of July tetanus. While the total casualties of the glorious day are less than a quarter what they were five years ago the deaths from tetanus have shown a much greater reduction. In 1903 there were 417 Fourth of July victims of that dread malady, in 1909 the number had been reduced to 130, while from last season's celebration there were but 3. This is life conservation in the true sense of the term. "Why not entirely eliminate the disease this year?" asks the United States Public Health Service.

The blank cartridge wound is the great cause of Fourth of July tetanus. When driven into the tissues the wadding carries with it innumerable bacilli, and the absorption of the poisonous products given off during the growth of these organisms produces the disease. The bacilli thrive only in the absence of oxygen. It is for this reason that the physician enlarges the wound of inlet and after removing all foreign material, dresses the injury in such a manner that development of the organisms is inhibited. In order to accomplish this it is usually necessary to administer a general anaesthetic. Anti-tetanic serum is of great value as a prophylactic measure, but it should be given soon after the receipt of the injury.

Parents should realize that Fourth of July tetanus is easy to prevent but extremely difficult to cure. No blank cartridge wound is too trivial to receive careful medical attention. However slight the injury may appear, summon a physician and at once adopt energetic measures. Reliance upon home treatment may prove disastrous and result in the sacrifice of life. In 1903, before the widespread recognition of the possibilities of preventive treatment, one case of tetanus developed to every 4 blank cartridge wounds reported; in 1914, there was but 1 case to every 40 such injuries. This is the measure of the success of preventive treatment.

**REPORT OF THE HYGIENIC LABORATORIES, OHIO
STATE BOARD OF HEALTH, FOR THE MONTH
ENDING JUNE 30, 1915.**

Diphtheria: Positive 43, negative 125, suspicious 9.....	177
Tuberculosis: Positive 101, negative 226.....	327
Typhoid: Positive 14, negative 45, atypical 4.....	63
Para-typhoid B, partial 1.....	1
Malaria: Negative 2, unsatisfactory 2.....	4
Rabies: Positive 18, negative 10, unsatisfactory 4.....	32
Miscellaneous 7.....	7
<hr/>	
Total diagnostic	611
<hr/>	
Existing water supply 68, proposed water supply 11.....	79
Typhoid and quality.....	95
Sanitary Survey 15.....	15
Columbus tap 24.....	24
Trade Waste 2.....	2
Miscellaneous 1.....	1
<hr/>	
Total water	216
Total number of examinations classified as above.....	827

REPORTED CASES OF NOTIFIABLE COMMUNICABLE DISEASES, JUNE, 1915.

	<i>Townships and</i>		
	<i>Cities.</i>	<i>Villages.</i>	<i>Total.</i>
Tuberculosis (all forms).....	470	79	549
Pneumonia	118	34	152
Typhoid fever	171	67	238
Diphtheria	277	87	364
Whooping cough	393	381	774
Measles	2,206	856	3,062
Scarlet fever	266	145	411
Chickenpox	409	118	527
Smallpox	88	264	352
Mumps	198	210	408
Gonorrhea	92	84	176
Syphilis	57	10	67
German measles	67	43	110
Epidemic Cerebro-spinal Meningitis.....	5	1	6
Acute Anterior Poliomyelitis.....	4	3	7
Ophthalmia Neonatorum	49	7	56
Trachoma	12	8	20
Tetanus	2	2	4
Malaria	3	....	3
Paratyphoid fever	1	1	2
Rabies	2	....	2
Chancroid	1	....	1
Total	4,891	2,400	7,291

COMMUNICABLE DISEASES, JUNE, 1915.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
ADAMS COUNTY—										
West Union	Vil.		1							
Wayne	Tp.					8				
ALLEN COUNTY—										
Delphos		2	1					1		
Lima		1	1		2	9	3		4	
Spencerville	Vil.		1							
German	Tp.				1	1				
Lafayette	Tp.					12				
Marion	Tp.					2				
Spencer	Tp.		1							
ASHLAND COUNTY—										
Ashland	Vil.		1							
Perry	Tp.							3		
ASHTABULA COUNTY—										
Ashtabula		1								
Conneaut				2			1			
Andover	Vil.			1		2	1			
Geneva	Vil.		1							
Jefferson	Vil.	2	1	1		1				
Rock Creek	Vil.			1						
Andover	Tp.					3				
Lenox	Tp.		1							
Monroe	Tp.		1							
Trumbull	Tp.								1	
Windsor	Tp.					1				
ATHENS COUNTY—										
Athens						13			1	
Nelsonville				1						
Buchtel	Vil.				5					
Athens	Tp.					1				
Carthage	Tp.				2	5				
Trimble	Tp.		1							
Waterloo	Tp.					1				
York	Tp.	1		1						
AUGLAIZE COUNTY—										
St. Marys				1			4		1	
Wapakoneta			1				1	1		
Minster	Vil.						3			
Duchouquet	Tp.						5			
BELMONT COUNTY—										
Bellaire		3	2	2	7	42	1	5		
Martins Ferry		1		1						
Belmont	Vil.				9	3				
Bridgeport	Vil.		2			9	8			
Brookside	Vil.						5			
Holloway	Vil.		1							
Shadyside	Vil.			1	4	2				
Colerain	Tp.	1								
Goshen	Tp.				5					
Somerset	Tp.				20	1				
Union	Tp.		1							
Warren	Tp.			1						
Washington	Tp.				6					
Wayne	Tp.		1				2	2		
York	Tp.	1								
BROWN COUNTY—										
Jefferson	Tp.							3		
BUTLER COUNTY—										
Hamilton		7		1	3			1		
Middletown						19	1			2
College Corner	Vil.				4					6
Oxford	Vil.					1				
Ross	Tp.		1					6		13

COMMUNICABLE DISEASES, JUNE, 1915—Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
CARROLL COUNTY—										
Rose	<i>Tp.</i>	1								
CHAMPAIGN COUNTY—										
Urbana	<i>Vil.</i>							2		1
Mutual	<i>Vil.</i>	2			2					1
St. Paris	<i>Tp.</i>				3					
Adams	<i>Tp.</i>					1				3
Concord	<i>Tp.</i>					1				4
Union	<i>Tp.</i>									
Urbana	<i>Tp.</i>				6					
Wayne	<i>Tp.</i>									
CLARK COUNTY—										
Springfield	<i>Vil.</i>	12	3	3	5	8	5	20		19
New Carlisle	<i>Vil.</i>		1		1	1				
South Charleston	<i>Vil.</i>		1		1					
Rethel	<i>Tp.</i>	1			2					
Moorefield	<i>Tp.</i>	1								
Springfield	<i>Tp.</i>			2						
CLERMONT COUNTY—										
Batavia	<i>Vil.</i>					1				
Miami	<i>Tp.</i>				4			4		
Pierce	<i>Tp.</i>		1							
CLINTON COUNTY—										
Blanchester	<i>Vil.</i>		1							
Midland	<i>Vil.</i>			1	2					
Chester	<i>Tp.</i>									3
Jefferson	<i>Tp.</i>									2
Wayne	<i>Tp.</i>									6
COLUMBIANA COUNTY—										
East Liverpool			2	1		2			9	
Salem	<i>Vil.</i>	2	1	2		1	2	1		
Wellsville	<i>Vil.</i>		3							
Columbiana	<i>Vil.</i>	1				2				
East Palestine	<i>Vil.</i>					1				
Lisbon	<i>Vil.</i>			2						
Salineville	<i>Vil.</i>								1	
Hanover	<i>Tp.</i>				5					
Liverpool	<i>Tp.</i>								1	
West	<i>Tp.</i>					1				
COSHOCTON COUNTY—										
Keene	<i>Tp.</i>					2	1			
Lafayette	<i>Tp.</i>									
CRAWFORD COUNTY—										
Galion	<i>Vil.</i>	1				39				
Crestline	<i>Vil.</i>					7				
New Washington	<i>Tp.</i>			1			1			
Auburn	<i>Tp.</i>					2				
Holmes	<i>Tp.</i>				10	2				
Liberty	<i>Tp.</i>		1			2				
CUYAHOGA COUNTY—										
Cleveland	<i>Vil.</i>	156	95	28	99	153	1,103	67	101	1
East Cleveland	<i>Vil.</i>			3	7	46				64
Bay	<i>Vil.</i>					2				
Redford	<i>Vil.</i>					1				
Berea	<i>Vil.</i>								3	
Cleveland Heights	<i>Vil.</i>				4			6		2
Chagrin Falls	<i>Vil.</i>				3					7
Euclid	<i>Vil.</i>			1		1				
Olmsted Falls	<i>Vil.</i>					6				
Rocky River	<i>Vil.</i>					11				
West Park	<i>Vil.</i>			1		2				
Bedford	<i>Tp.</i>					1	1			
Chagrin Falls	<i>Tp.</i>			1						
Euclid	<i>Tp.</i>			1		2				

COMMUNICABLE DISEASES, JUNE, 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
CUYAHOGA COUNTY—Concluded.										
Mayfield	<i>Tp.</i>				3	2				
Parma	<i>Tp.</i>					2				
Royalton	<i>Tp.</i>					12				
Warrensville	<i>Tp.</i>					3				
DARKE COUNTY—										
Greenville	<i>Vil.</i>	1				1	2			
Ansonia	<i>Vil.</i>		1	2			1			
Arcanum	<i>Vil.</i>									1
Burkettsville	<i>Vil.</i>								1	
Osgood	<i>Vil.</i>					1				
Versailles	<i>Vil.</i>						3			
Butler	<i>Tp.</i>								13	1
Wabash	<i>Tp.</i>									1
DEFIANCE COUNTY—										
Defiance	<i>Tp.</i>	1		1	2		1		1	
Adams	<i>Tp.</i>			1			1			
Defiance	<i>Tp.</i>			1						
Noble	<i>Tp.</i>			1						
Richland	<i>Tp.</i>						1			
DELAWARE COUNTY—										
Delaware						1				
Ostrander	<i>Vil.</i>					1				
Delaware	<i>Tp.</i>		1			2				
ERIE COUNTY—										
Sandusky		2		1	1	17	1	1	1	3
Berlin Heights	<i>Vil.</i>							1		
Vermilion	<i>Vil.</i>					12				
Groton	<i>Tp.</i>						1			
Huron	<i>Tp.</i>					3				
Margaretta	<i>Tp.</i>			1						
Perkins	<i>Tp.</i>	1				1				
FAIRFIELD COUNTY—										
Lancaster			5			3				
Amanda	<i>Vil.</i>					1				
Carroll	<i>Vil.</i>		2			6				
Pleasantville	<i>Vil.</i>									
Rushville	<i>Vil.</i>					3				
Berne	<i>Tp.</i>			1		8				
Bloom	<i>Tp.</i>					3				
Clear Creek	<i>Tp.</i>			1						
Greenfield	<i>Tp.</i>					7				
Liberty	<i>Tp.</i>					1				
Pleasant	<i>Tp.</i>					10				
Rush Creek	<i>Tp.</i>	1		1						
Walnut	<i>Tp.</i>					2				
FAYETTE COUNTY—										
Washington C. H.			1	1						4
Green	<i>Tp.</i>				25					
Jasper	<i>Tp.</i>									3
Jefferson	<i>Tp.</i>		1		1					2
Paint	<i>Tp.</i>	1								2
Wayne	<i>Tp.</i>				10					
FRANKLIN COUNTY—										
Columbus		43	3	4	13	36	90	12	26	1
Bexley	<i>Vil.</i>						2			
Gahanna	<i>Vil.</i>						12			
Westerville	<i>Vil.</i>					3				
Worthington	<i>Vil.</i>						2			
Hanford	<i>Vil.</i>						2			
Franklin	<i>Tp.</i>	3			1					
Marion	<i>Tp.</i>	1								
Sharon	<i>Tp.</i>					5				1
Washington	<i>Tp.</i>					2				

COMMUNICABLE DISEASES, JUNE, 1915—Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
FULTON COUNTY—										
Delta	Vil.					3				
Fayette	Vil.				6					
Swanton	Vil.	1						1		
GALLIA COUNTY—										
Gallipolis				2		1				
Green	Tp.					1				
Perry	Tp.	1				4				
GEAUGA COUNTY—										
Chardon	Vil.					3				
Bainbridge	Tp.							12		
Chardon	Tp.								1	
Huntsburg	Tp.				1					1
Middlefield	Tp.					1				
Montville	Tp.					1			1	
Russell	Tp.			1						
Thompson	Tp.								2	
GREENE COUNTY—										
Yellow Springs	Vil.	1								
New Jasper	Tp.				2					
Ross	Tp.			1						
Silver Creek	Tp.				2			1		
Spring Valley	Tp.				1					
Sugar Creek	Tp.						2			
GUERNSEY COUNTY—										
Cambridge		2		6	7		1			
Byesville	Vil.	1			4					
Center	Tp.			2	1					
Jackson	Tp.			1						
HAMILTON COUNTY—										
Cincinnati		132	23	58	17	367	18	50	4	34
Norwood		5	1	1	1	6	1	5		
St. Bernard						2				
Addyston	Vil.		1	1						
Glendale	Vil.			1						
Lockland	Vil.	1								
Sharonville	Vil.		1							
Anderson	Tp.		1	2	2	4				
Columbia	Tp.		1	1						
Delhi	Tp.			2						
Miami	Tp.			1						
HANCOCK COUNTY—										
Findlay		2		1		5	1	2		
Amanda	Tp.				2					4
Cass	Tp.								6	
Delaware	Tp.				1			1		
Liberty	Tp.			1						
Portage	Tp.						1			
Van Buren	Tp.					3				
HARDIN COUNTY—										
Kenton				3		2		2	2	
Ada	Vil.					3				
Forest	Vil.					1				
Liberty	Tp.					3				
Lynn	Tp.								1	
McDonald	Tp.								4	
HARRISON COUNTY—										
Bowerston	Vil.		1							
Cadiz	Vil.	2	2							
Jewett	Vil.									15
Athens	Tp.		1							
HENRY COUNTY—										
Deshler	Vil.							6	3	
Holgate	Vil.				1					
Pleasant	Tp.				1		1			

COMMUNICABLE DISEASES, JUNE, 1915—Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
HIGHLAND COUNTY—										
Greenfield	Vil.				4					
Paint	Tp.							6		
HOCKING COUNTY—										
Logan	Vil.					1			1	
Murray	Vil.					20				
Starr	Tp.				2	4		4		
Ward	Tp.								1	
Washington	Tp.					1				
HOLMES COUNTY—										
Millersburg	Vil.						1			
Berlin	Tp.			4	2					
Hardy	Tp.						2			
Salt Creek	Tp.			1						
HURON COUNTY—										
Bellevue					7	74				
Norwalk						6		1		
Monroeville	Vil.						1			
New London	Vil.	3			1					
Fairfield	Tp.		1							
New London	Tp.				1					
Pitchville	Tp.	1								
Peru	Tp.					1				
Townsend	Tp.				2			1		
JACKSON COUNTY—										
Jackson									1	
Wellston									3	
Coalton	Vil.		1							
Bloomfield	Tp.									3
Madison	Tp.							1		
Milton	Tp.		1							
JEFFERSON COUNTY—										
Steubenville			2				1			
Amsterdam	Vil.							3		
Toronto	Vil.		2					2		
Stratton	Vil.			1						
Cross Creek	Tp.					1				
Knox	Tp.	1	1							
Salem	Tp.						3			
Saline	Tp.			2						
KNOX COUNTY—										
Mt. Vernon						40	1			
Danville	Vil.				3					
Clinton	Tp.					3				
Middlebury	Tp.					6				
Pleasant	Tp.					15				
Union	Tp.				20	1				6
LAKE COUNTY—										
Mentor	Vil.	1	1							
Willoughby	Vil.			1						
Leroy	Tp.					1				
LAWRENCE COUNTY—										
Ironton			3			9				
Coal Grove	Vil.	1								
Hanging Rock	Vil.	1								
Rome	Tp.					15				
Symmes	Tp.					1				
Union	Tp.					6				
LICKING COUNTY—										
Alexandria	Vil.					1				
Hebron	Vil.					9				2
Pataskala	Vil.		1							
Utica	Vil.				3					
Bennington	Tp.				2					1

COMMUNICABLE DISEASES, JUNE, 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.	
LICKING COUNTY—Concluded.											
Eden	Tp.					1					
Fallsburg	Tp.		1								
Granville	Tp.					2					
Hanover	Tp.		1			5					
Harrison	Tp.		1								
Hartford	Tp.				2						
Hopewell	Tp.					6					
Jersey	Tp.	1									
Lima	Tp.	1	1		2	1					
Madison	Tp.				1	13		1			
Marry Ann	Tp.					5				1	
Newark	Tp.					2					
St. Albans	Tp.					5					
Union	Tp.	1			3	17		5		28	
LOGAN COUNTY—											
Bellefontaine			1			4		24			
Rushsylvania	Vil.						3		4		
Zanesfield	Vil.										
McArthur	Tp.	2									
LORAIN COUNTY—											
Elyria						14	3	1	5		
Lorain		2	1	4	4	12	3	2			
Amherst	Vil.					6					
LaGrange	Vil.								1		
Oberlin	Vil.					21					
Avon	Tp.					4					
Carlisle	Tp.					2					
Columbia	Tp.					1					
Elyria	Tp.						1				
Huntington	Tp.					2					
Ridgeville	Tp.					1					
LUCAS COUNTY—											
Toledo		54	3	60	17	101	108	14	76	12	4
Maumee	Vil.						1				
Jerusalem	Tp.					3					
Washington	Tp.						15		1		
MADISON COUNTY—											
Jefferson	Tp.						2				
Pleasant	Tp.					7					
MAHONING COUNTY—											
Youngstown		5	4	2	4	1	19	3	4	4	6
East Youngstown	Vil.	1	1		1		1	1			
Poland	Vil.						2				6
Sebring	Vil.			2	1	2			1		4
Struthers	Vil.						2	1			
Austintown	Tp.										2
Beaver	Tp.							4			2
Berlin	Tp.			2							
Boardman	Tp.		1				6		2		10
Coitsville	Tp.			1			1			1	2
Milton	Tp.	1									
Poland	Tp.						1				
MARION COUNTY—											
Marion		1		1			9	1	6		
Caledonia	Vil.									2	
Larue	Vil.	1								7	
Morral	Vil.						3				
Claridon	Tp.				1						
Green Camp	Tp.				1			5			
Montgomery	Tp.						1			1	
Prospect	Tp.						2				
Waldo	Tp.						1				

COMMUNICABLE DISEASES, JUNE, 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MEDINA COUNTY—										
Medina	Vil.	1								
Seville	Vil.							2		1
Wadsworth	Vil.					29				
Brunswick	Tp.					25				
Chatham	Tp.					7				6
Guilford	Tp.					1				
Lafayette	Tp.					3				
Litchfield	Tp.					3				
Montville	Tp.		1							
Sharon	Tp.					6				
Wadsworth	Tp.					2	1			
York	Tp.					1				
MEIGS COUNTY—										
Middleport	Vil.			1		7				
Racine	Vil.					10				
Rutland	Vil.	1				1				
Bedford	Tp.					27				
Rutland	Tp.		1			6				
Chester	Tp.					1				
Salem	Tp.					3				
Sutton	Tp.	2				13				
MERCER COUNTY—										
Celina	Vil.			1		1	8			
Coldwater	Vil.			3						
Montezuma	Vil.		1				1			
Black Creek	Tp.								3	
Butler	Tp.			1			1			
Center	Tp.	1					7			
Granville	Tp.									1
Liberty	Tp.					1				
Marion	Tp.			1					1	
Union	Tp.				10					
MIAMI COUNTY—										
Piqua		2	1		6	23	4	1		4
Troy				2						
Covington	Vil.	1					8			
Laura	Vil.					2				
West Milton	Vil.							1		
Brown	Tp.				2					1
Elizabeth	Tp.					1				
Lost Creek	Tp.									2
Newton	Tp.						1			
Washington	Tp.					1				
MONROE COUNTY—										
Beallsville	Vil.						13			
Clarington	Vil.						2			
Bethel	Tp.				2		13			
MONTGOMERY COUNTY—										
Dayton		16	2	3	5	34	17	48	17	21
Brookville	Vil.							1		
Farmersville	Vil.							1		
Miamisburg	Vil.						2	8		
West Carrollton	Vil.			1						
Butler	Tp.		1			12				
Jefferson	Tp.	1								
Madison	Tp.			1						
Mad River	Tp.				5					
Perry	Tp.	1				2				
Washington	Tp.						1			

COMMUNICABLE DISEASES, JUNE, 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MORGAN COUNTY—										
Chesterhill	Vil.									1
Bloom	Tp.				28					
Center	Tp.		1							
Marion	Tp.					1				
Penn	Tp.					5				
Union	Tp.					1				
MORROW COUNTY—										
Mt. Gilead	Vil.		1							
Sparta	Vil.	1								
Bennington	Tp.		1							
South Bloomfield	Tp.					2				
MUSKINGUM COUNTY—										
Zanesville		1	2		2	1	2	1	1	
Jefferson	Tp.	2			10					
Meigs	Tp.	1								
Salem	Tp.				4					
NOBLE COUNTY—										
Sarahsville	Vil.		1							
Buffalo	Tp.			6						
Jefferson	Tp.	1								
Marion	Tp.				1					
OTTAWA COUNTY—										
Marblehead	Vil.									1
Ray	Tp.						1			
Danbury	Tp.		1			1		2		4
Portage	Tp.								2	
PAULDING COUNTY—										
Haviland	Vil.								1	
Latty	Vil.								1	
Oakwood	Vil.	2								
Payte	Vil.					1				
Brown	Tp.								3	
Emerald	Tp.					2				
Jackson	Tp.								3	
Paulding	Tp.								2	
Washington	Tp.								3	
PERRY COUNTY—										
Corning	Vil.	1						2		
Crooksville	Vil.					2				
Hemlock	Vil.								1	
New Lexington	Vil.						1			
New Straitsville	Vil.		1					1	115	
Shawnee	Vil.								2	
Somerset	Vil.				8				1	
Thornville	Vil.				10	8				
Coal	Tp.					1			5	
Harrison	Tp.							2	2	
Hopewell	Tp.					3				
Monday Creek	Tp.					3			11	
Monroe	Tp.							10		
Pike	Tp.	1							1	
Thorn	Tp.				4					
PICKAWAY COUNTY—										
Circleville						62				
Darby						2				
Scioto	Tp.		2							
PIKE COUNTY—										
Beaver	Tp.					1				
Pebble	Tp.					3				4
Sunfish	Tp.	1				1				
Newton	Tp.			1	5					

COMMUNICABLE DISEASES, JUNE, 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
PORTAGE COUNTY—										
Ravenna				1						
Brimfield	<i>Tp.</i>		1							
Charlestown	<i>Tp.</i>			1						
Nelson	<i>Tp.</i>	1								
Palmyra	<i>Tp.</i>							2		
Ravenna	<i>Tp.</i>						2			
Shalersville	<i>Tp.</i>					1				
Suffield	<i>Tp.</i>		1				1			
PREBLE COUNTY—										
Eaton	<i>Vil.</i>									2
New Paris	<i>Vil.</i>				2					6
West Elkton	<i>Vil.</i>									
Dixon	<i>Tp.</i>		1							
Gratis	<i>Tp.</i>				3					
PUTNAM COUNTY—										
Belmore	<i>Vil.</i>					2				
Gilboa	<i>Vil.</i>								3	
Glandorf	<i>Vil.</i>		1							
Pandora	<i>Vil.</i>			1		3				
West Leipsic	<i>Vil.</i>				3					
Monroe	<i>Tp.</i>					6			21	
Ottawa	<i>Tp.</i>				1					
Riley	<i>Tp.</i>					4				
Union	<i>Tp.</i>			1						
RICHLAND COUNTY—										
Mansfield		2		3	3	1	6	17		9
Lexington	<i>Vil.</i>				2					
Shelby	<i>Vil.</i>				2	6				
Cass	<i>Tp.</i>					1				
Jackson	<i>Tp.</i>					2				
Perry	<i>Tp.</i>			1		2				
Weller	<i>Tp.</i>		1							
ROSS COUNTY—										
Chillicothe		2	4	1	2			2		3
Clarksburg	<i>Vil.</i>			1						
Kingston	<i>Vil.</i>				2					
Jefferson	<i>Tp.</i>									2
Liberty	<i>Tp.</i>	1								
Paint	<i>Tp.</i>							2		
Scioto	<i>Tp.</i>				1					
Springfield	<i>Tp.</i>									1
SANDUSKY COUNTY—										
Fremont					1	4		16		2
Sandusky	<i>Tp.</i>					2				
Townsend	<i>Tp.</i>		2			15				
York	<i>Tp.</i>					3				
SCIOTO COUNTY—										
Portsmouth		2			1		5	10		
Brush Creek	<i>Tp.</i>									6
Valley	<i>Tp.</i>									
Washington	<i>Tp.</i>				1					
Porter	<i>Tp.</i>			1						
SENECA COUNTY—										
Fostoria		2		1	1	1			13	
Tiffin				1		1				
Bloomville				1						
Adams	<i>Tp.</i>						1			
Big Spring	<i>Tp.</i>				2					
Thompson	<i>Tp.</i>	1			1	3				

COMMUNICABLE DISEASES, JUNE, 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
SHELBY COUNTY—										
Sidney				1						
Dinsmore	<i>Tp.</i>								1	
Perry	<i>Tp.</i>				1					2
STARK COUNTY—										
Canton	3		1	5	1	22	29	5	1	3
Massillon						3		2		
Limaville	<i>Vil.</i>					4				
Waynesburg	<i>Vil.</i>					3				
Bethlehem	<i>Tp.</i>					7				
Canton	<i>Tp.</i>	2					1			
Marlboro	<i>Tp.</i>						2			
Perry	<i>Tp.</i>			2						
Plain	<i>Tp.</i>			1			1			
Sandy	<i>Tp.</i>					1				
SUMMIT COUNTY—										
Akron	1		2	9		11	19	5	22	
Barberton				10		1	3			
Cuyahoga Falls	<i>Vil.</i>		1			2		4		
Hudson	<i>Vil.</i>					2				
Kenmore	<i>Vil.</i>					1	5			
Bath	<i>Tp.</i>	1								
Copley	<i>Tp.</i>						1		4	
Coventry	<i>Tp.</i>			1			1			
Portage	<i>Tp.</i>						1		20	
Springfield	<i>Tp.</i>						2			
Tallmadge			1			2				
TRUMBULL COUNTY—										
Niles						8				
Warren	2		4			80				15
Gerard	<i>Vil.</i>						2			
Orangeville	<i>Vil.</i>	1								
Braceville	<i>Tp.</i>		1		1			1		
Hubbard	<i>Tp.</i>	2					4			4
Lordstown	<i>Tp.</i>		1							
Mecca	<i>Tp.</i>									
Vienna	<i>Tp.</i>					2	1			
Warren	<i>Tp.</i>			1						
TUSCARAWAS COUNTY—										
Canal Dover			1	1		1	1			
New Philadelphia	1			2	2			1		2
Bolivar	<i>Vil.</i>					1				
Dennison	<i>Vil.</i>			1						
Uhrichsville	<i>Vil.</i>			8						
Lawrence	<i>Tp.</i>							3		
Mill	<i>Tp.</i>									
Sandy	<i>Tp.</i>	1		8						
UNION COUNTY—										
Claibourne	<i>Tp.</i>	1								
Darby	<i>Tp.</i>		1							
Leesburg	<i>Tp.</i>				6					
Union	<i>Tp.</i>		1					8		
VAN WERT COUNTY—										
Van Wert				1						
Willshire	<i>Vil.</i>					1				1
Harrison	<i>Tp.</i>					6				4
Jackson	<i>Tp.</i>						1	2		
Liberty	<i>Tp.</i>					1				
York	<i>Tp.</i>					4				
VINTON COUNTY—										
Elk	<i>Tp.</i>						1			
Knox	<i>Tp.</i>		1							
Wilkesville	<i>Tp.</i>					5				

COMMUNICABLE DISEASES, JUNE, 1915—Concluded.

This table records cases of specified diseases reported to the State Board of Health for the month of June, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
WARREN COUNTY—										
Maineville	Vil.					13				
South Lebanon	Vil.									4
Waynesville	Vil.				1					
Hamilton	Tp.					3				2
Union	Tp.									10
WASHINGTON COUNTY—										
Belpre	Vil.					31				
Belpre	Tp.					11	1			
Dunham	Tp.		1			1				
Grandview	Tp.	1								
Newport	Tp.			5		2			1	
Warren	Tp.	1	1	1				1		
Watertown	Tp.	1	1							
WAYNE COUNTY—										
Dalton	Vil.	1								
Smithville	Vil.					8				
Chippewa	Tp.					3	1			
Congress	Tp.		1							
East Union	Tp.					3				
Greene	Tp.					1				
WILLIAMS COUNTY—										
Bryan	Vil.						2			
Edgerton	Vil.		1							
Montpelier	Vil.									
Stryker	Vil.	3								
Jefferson	Tp.					11				
WOOD COUNTY—										
Bowling Green			1							
Grand Rapids	Vil.				3	1				
Bloom	Tp.					2				
Liberty	Tp.			1						
Perry	Tp.					1				
Plain	Tp.						1			
Ross	Tp.	1	1							1
WYANDOT COUNTY—										
Nevado	Vil.					5				
Upper Sandusky	Vil.	3			1			2		
Antrim	Tp.	1								
Marseilles	Tp.					1				
Mifflin	Tp.					4				

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, JUNE, 1915.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
ALLEN COUNTY—								
Delphos	1	1						
Lima	1							
Spencerville Vil	1							
ASHLAND COUNTY—								
Loudonville Vil.	2							a 1
Milton Tp.					1			
ASHTABULA COUNTY—								
Jefferson Vil.			1					
ATHENS COUNTY—								
Athens	2	2						
Buchtel Vil.	2	2						
Dover Tp.	1							
Rome Tp.	1	1				1		
AUGLAIZE COUNTY—								
Wapakoneta	2							
BELMONT COUNTY—								
Bellaire	6		3					
Colerain Tp.							1	
Union Tp.	2							
Washington Tp.						2		
BUTLER COUNTY—								
Hamilton						1		b 1
Middletown	3					1		
CHAMPAIGN COUNTY—								
Jackson Tp.		1						
CLARK COUNTY—								
Springfield	5	5				1	1	a 1
CLERMONT COUNTY—								
Owensville Vil.	1							
Jackson Tp.	1		1					
COLUMBIANA COUNTY—								
East Liverpool	1	2						
Leetonia			3			1		
COSHOCTON COUNTY—								
Adams Tp.	1							
CUYAHOGA COUNTY—								
Cleveland	4	3		3	4	39	5	a c 3
East Cleveland						2		
Cleveland Hts.	14							
Royalton Tp.	2							
DARKE COUNTY—								
Ansonia Vil.	1							
DEFIANCE COUNTY—								
Defiance	1	1						
ERIE COUNTY—								
Sandusky		1					1	
FAIRFIELD COUNTY—								
Carroll Vil.	1							
FAYETTE COUNTY—								
Green Tp.	3							
FRANKLIN COUNTY—								
Columbus	6	1	1			3		d 1
HAMILTON COUNTY—								
Cincinnati	16	17	52	1			1	e 1
Norwood		1	8					
Addyston Vil.	1		6					
Anderson Tp.	1	1						
HARDIN COUNTY—								
Alger Vil.			1					
HARRISON COUNTY—								
Monroe Tp.	1							

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, JUNE, 1915 — Continued.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
HIGHLAND COUNTY—								
Greenfield	<i>Vil.</i> 4							
Paint	<i>Vil.</i> 1							
LAKE COUNTY—								
Mentor	<i>Tp.</i>					1		
LAWRENCE COUNTY—								
Union	<i>Tp.</i>		10					
LICKING COUNTY—								
Hartford	<i>Tp.</i> 4							
Lima	<i>Tp.</i> 1							
Union	<i>Tp.</i> 2	1				1		
LOGAN COUNTY—								
Bokes Creek	<i>Tp.</i> 1							
LORAIN COUNTY—								
Lorain	5							
LUCAS COUNTY—								
Toledo	23	10				1		c 1
MAHONING COUNTY—								
Youngstown	5	6		1		1		b 1
East Youngstown	<i>Vil.</i> 3						2	
Beaver	<i>Tp.</i> 1							
MARION COUNTY—								
Prospect	<i>Vil.</i> 2	1						
MEDINA COUNTY—								
Brunswick	<i>Tp.</i> 1							
MEIGS COUNTY—								
Middleport	<i>Vil.</i> 2							
Racine	<i>Vil.</i>		3					
Chester	<i>Tp.</i>						1	
Sutton	<i>Tp.</i>		1					
MERCER COUNTY—								
Liberty	<i>Tp.</i> 1							
Union	<i>Tp.</i> 1							
MONTGOMERY COUNTY—								
Dayton	8	3						
Madison	<i>Tp.</i>				1			
Perry	<i>Tp.</i> 1							
MORGAN COUNTY—								
Penn	<i>Tp.</i> 1							
MUSKINGUM COUNTY—								
Meigs	<i>Tp.</i> 3							
PAULDING COUNTY—								
Antwerp	<i>Vil.</i>			1				
PERRY COUNTY—								
New Straitsville	<i>Vil.</i>		1					
PUTNAM COUNTY—								
Union	<i>Tp.</i> 1							
PIKE COUNTY—								
Newton	<i>Tp.</i> 1							
ROSS COUNTY—								
Chillicothe	1	3						
Paint	<i>Tp.</i> 2		6					
SANDUSKY COUNTY—								
Fremont			2					
SCIOTO COUNTY—								
Portsmouth	<i>Tp.</i>						3	
Valley	<i>Tp.</i>							a 1
Washington	<i>Tp.</i>						2	
SENECA COUNTY—								
Fostoria	<i>Tp.</i> 1							
Liberty	<i>Tp.</i> 1							
Scipio	<i>Tp.</i>		1					

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, JUNE, 1915 — Concluded.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
SHELBY COUNTY—								
Perry .....Tp.	1	1						
STARK COUNTY—								
Canton .....Tp.							1	
Limaville .....Vil.			2					
Plain .....Tp.							2	
SUMMIT COUNTY—								
Akron .....Tp.					1			
TRUMBULL COUNTY—								
Champion .....Tp.			6					
Hubbard .....Tp.	1							
TUSCARAWAS COUNTY—								
New Philadelphia .....Tp.	2	1	1					
UNION COUNTY—								
Claibourne .....Tp.	1							
VAN WERT COUNTY—								
Jackson .....Tp.								d 1
WARREN COUNTY—								
Lebanon .....Tp.	6	1						
WASHINGTON COUNTY—								
Dunham .....Tp.	4	1						
Warren .....Tp.	1		1					
WAYNE COUNTY—								
Dalton .....Tp.						1		
WILLIAMS COUNTY—								
Montpelier .....Vil.	1							
WOOD COUNTY—								
MillburyVil.	1							

a Tetanus.

b Rabies.

c Malaria.

d Paratyphoid Fever.

e Chancroids.

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- Directions for Living and Sleeping in the Open Air. 24 p. 1913.
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The Ohio Public Health Journal

OHIO STATE BOARD OF HEALTH

EDITED BY

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THE DISINFECTION OF WATER.

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The establishment of practical methods of disinfection of water during the past few years has marked one of the most important epochs in the development of the art of water purification. At the present time disinfection of polluted municipal water supplies as the only method of treatment or as an adjunct to other methods of purification is practiced quite generally throughout the United States. The disinfection of water supplies which are temporarily used has also grown to be a customary procedure. Water supplies for private, military and construction camps, summer homes and resorts, hospitals, etc., are frequently polluted and in an attempt to render such supplies of safe sanitary quality disinfection has been adopted as the practical method. In view of the great development which has taken place in the the art of purification of water by disinfection it may be well to discuss the methods which have been attempted and which are now in use.

A water supply is of perfect quality when its physical, chemical and hygienic characteristics are satisfactory. Rarely is such a water found, and to attain this standard, it is generally necessary to provide some form of treatment. The object in the treatment of the supply may be to improve its physical quality, chemical quality, or hygienic quality, but in most instances, especially if a surface source is used, the supply will be found faulty in more than one respect. To produce a water of entirely satisfactory quality in such cases, the treatment must provide for the correction of each deficiency.

The improvement of the physical quality of a water may require the removal of turbidity, odor and taste and the reduction of dissolved color. The improvement of the chemical quality of a water may include the removal of excessive amounts of iron, manganese, acidity, or hardness. The improvement of the hygienic quality of water involves the removal of bacteria, particularly those which are pathogenic.

TREATMENT OF WATER.

Purpose.	Content to be removed or reduced.	Methods of Improvement.
Improvement of Physical Quality.	Turbidity. Odor. Taste. Color.	Plain Sedimentation and Storage. Coagulation and Sedimentation. Softening. Filtration. Aeration. Disinfection.
Improvement of Chemical Quality.	Iron. Manganese. Hardness. Acidity.	
Improvement of Hygienic Quality.	Bacteria.	

A number of methods of improvement of the quality of water supplies has been developed. The improvement of physical characteristics of water received first attention, but since development of the germ theory of disease particular attention has been given to the improvement of hygienic quality. Of more recent occurrence has been the development of methods of the improvement of the chemical quality of water supplies. In a general way it may be stated that water supplies are improved by the following methods:

1. Plain Sedimentation and Storage.
2. Coagulation and Sedimentation.
3. Softening.
4. Filtration.
5. Aeration.
6. Disinfection.

The above methods are practiced individually as listed, or in various combinations to secure the improvement of the water supply desired. In fact, all of the above methods may be used in the treatment of a single water supply to improve a water which is deficient in physical, chemical and hygienic quality.

For the purposes of this discussion we are particularly interested in the last mentioned method, disinfection. This method is practised in the treatment of public water supplies alone or in combination with

other methods of treatment and is also extensively used for quasi-public and private water supplies.

Extensive studies have been conducted by various investigators in this country and abroad to determine the efficiency and practicality of numerous agencies of disinfection. Clark and Gage¹ conducted a research of disinfectants for water and sewage in 1907, 1908 and 1909, trying permanganate of potash, bleaching powder, formaldehyde, hydrogen peroxide, boric acid, benzoic acid and sodium benzoate, phenols, corrosive sublimate, copper salts and many others. Rideal² mentions citric acid, iodine and cuprous chloride among other available disinfectants. Parkes and Rideal³ have recommended sodium bisulphate as a practical disinfectant for water. Many other chemicals and agencies of disinfection have been proposed and used to a limited extent and with varying results.

During the last ten years much careful study and attention to this important subject has been given with the result that we have now available practical methods for disinfecting water on a large scale for municipal supplies as well as on a small scale for individual use.

In this discussion a number of disinfectants which have been studied and used to a limited extent will be omitted and only the following agents will be considered:

1. Heat.
2. Copper and its salts.
3. Permanganates.
4. Ozone.
5. Hypochlorites and Chlorine.
6. Lime.
7. The Ultra Violet Ray.

Heat. By boiling or distillation water may be rendered safe for domestic use. This fact has been recognized for many years and the method has been used extensively to render polluted water supplies safe for drinking. It has rarely been employed for the purification of public water supplies, although at Troon, Scotland, at Perim and Kossier on the Red Sea⁴ and in several South American cities, quite extensive plants for the distillation of water are in use to convert salt water into a potable supply. The method is also employed generally on sea-going vessels to furnish a water supply for all purposes. Distillation of water renders it free from bacteria and practically pure from a chemical standpoint. Distilled water has an unsatisfactory flat taste, but by aeration this defect is partially corrected.

Claims have been made occasionally that distilled water is too pure and hence not adapted for drinking purposes. It appears, however, that these statements are not based upon physiological principles or clinical experience.⁵

Boiling of water renders it satisfactory from a hygienic standpoint. It is known that pathogenic bacteria are killed by a temperature of 60° centigrade maintained for 20 minutes⁵ and only the most resistant organisms can exist at the temperature of boiling. No diminishment of the organic content of the water results. The dissolved gases including carbon-dioxide are expelled, bringing about a partial softening of the water due to the precipitation of carbonates. By boiling and sedimentation a degree of clarification of turbid water may be brought about.

In cities having polluted water supplies boiling of water for drinking purposes by the individual consumers is a safe procedure generally recommended by health authorities and water works officials. The method can also be practiced by travelers and campers at slight expense and inconvenience. It is generally conceded that the disinfection of municipal water supplies by boiling is impracticable due to the expense involved.

Several types of devices have been developed for the sterilization of water by heat. These are adapted to individual use and also to the purification of large quantities of water to serve in case of epidemics. Recently⁶ a French manufacturer has marketed an apparatus for use in households, schools, hospitals, etc., which produces sterilization by heating water under pressure to a temperature of 115° centigrade without causing boiling.

During the World's Fair at Chicago in 1893, sterilized drinking water was used by 15,000 employees. The sterilization was effected by passing the water through boiler feed water heaters where it was raised to a temperature of boiling and held at this point for a short time. No typhoid fever occurred while this water was being used, but intestinal disorders arose during interruptions of operation of the sterilizer.⁷

Copper. In 1904 copper as an algicide and disinfectant for water supplies was studied by Moore and Kellerman of the U. S. Department of Agriculture.⁸ The results of these studies led to the conclusion that copper and its salts were active algicides and also effective as agencies for disinfection. The report of the studies indicated that metallic copper placed in water was effective in bringing about complete sterilization in from 3 to 48 hours. Subsequent studies,⁹ however, demonstrated that the effect of copper and its salts as a

germicide was much less than as an algicide and that its action was easily inhibited by the presence of both organic and inorganic substances. The use of copper does not prevent or even materially reduce putrefaction and tastes and odors resulting from it.¹⁰ At the present time it is not generally accepted as an efficient disinfectant for water, although it has been used with favorable results in connection with ferrous sulphate in water treatment.¹¹

Permanganates. Sodium, potassium and calcium permanganates have been used at various times to disinfect water. The permanganates are powerful oxidizing agents to which is attributed the bactericidal action. Permanganate of potash has been used extensively in India¹² for the disinfection of private wells during cholera epidemics and has been efficient in checking the spread of the disease. It was also used during the Boer war to disinfect drinking water for the British troops in the field and is employed in the treatment of the public water supply of Bloemfontein, South Africa.¹ It has been studied by the Massachusetts State Board of Health, at the Lawrence Experiment Station,¹ the results of which study indicated that the application of 5 parts per million effected a satisfactory reduction of total bacteria, but was inefficient in reducing bacteria incubated at body temperature.

In its use the potassium permanganate is dissolved in the water to be treated in an amount to produce a faint pink color, which indicates that an excess of oxygen is present. The organic matter present in the water is oxidized before the bacteria are affected and for this reason many authorities do not favor the use of permanganates for the treatment of polluted water supplies. It appears that permanganate may have some value in purifying relatively small quantities of drinking water, but due to its doubtful efficiency and high cost, its use for disinfection of municipal water supplies will always be limited.

Ozone. The utility of ozone as a germicide has been known since 1886, although its application in water treatment has been of recent occurrence.¹³ In Europe several large installations have been made for the treatment of municipal water supplies in conjunction with filtration, notably at Paris and at Petrograd. Plants have also been installed at Lindsay, Ontario, and Ann Arbor, Michigan, but the process has not been extensively employed on the American Continent. The use of ozone as a method of disinfection of the water supply of Montreal was considered,¹⁴ but discarded in favor of cheaper and more satisfactory methods of disinfection. A small ozone plant as an adjunct to a rapid sand filter plant for the office building of the

Chicago, Burlington & Quincy Railroad of Chicago¹⁵ was installed in 1914 to disinfect the drinking water supply for some 3,000 persons.

Ozone is a modified form of oxygen produced by the passage of an electric current through air. It is a powerful oxidizing agent and an active disinfectant. The ozone is conducted into the water to receive treatment with which it mixes and causes the death of the bacteria contained. A number of ozonators have been developed in Europe and have been used with varying degrees of success. Considerable difficulty has resulted in securing constancy of production of ozone, and a proper mixture of the ozone with the water, which are necessary to produce a satisfactory efficiency. The cost of the treatment is reported to be excessive, being estimated by the city engineer of Paris at \$6 to \$7 per million gallons. In the face of more efficient and less costly methods of disinfection, it does not appear that ozone will be extensively used in the future. It is not generally considered as an available means for disinfection of the water supply in the household. A small household ozonator has been developed,¹⁶ but has not been extensively employed for water treatment. (Additional references — 17 and 18.)

*Chlorine.** The use of chlorine as a disinfectant has developed entirely during the 19th century and has followed closely the commercial production of bleaching powder. It is available in the form of calcium hypochlorite, sodium hypochlorite and liquid chlorine. The efficiency of chlorine as a disinfectant was recognized as early as 1854 by the Royal Commission on Sewage Disposal of the British Government. Experiments in the disinfection of sewage by hypochlorites were conducted in Germany, England and the United States from 1897 to 1907 and its first use in water disinfection was in 1897 at Maidstone, England. Previous to 1908 chlorine in its various forms had been used for intermittent treatment of water supplies and disinfection of distributing systems, but had not been adopted as a continuous method of treatment. Following extensive studies at Chicago and Boonton, New Jersey in 1908, the use of hypochlorite of lime as an agency for continuous treatment of a public water supply was adopted. Since that time the method has been introduced in over 300 cities in this country. It is employed extensively as the only method of treatment of the supply and in numerous cases as an adjunct to other purifying processes. In Ohio 19 water supplies serving a total population of 1,800,000 receive treatment by chlorine in the form of calcium hypochlorite, or as the liquid. Of these, 10 are filtered supplies.

* References 19 to 27.

Calcium hypochlorite, bleach, bleaching powder, or chloride of lime, as it is variously known, is a soluble white powder which in solution and in the presence of carbonic acid gas forms an unstable hypochlorous acid which acts upon organic matter and bacteria, destroying the latter by oxidation. The only compound which remains in the water as a result of the treatment is a small quantity of calcium chloride which is inert and harmless. The nascent oxygen formed by the breaking down of hypochlorous acid is the active agency of disinfection. Sodium hypochlorite is formed by the action of an electric current on a salt solution. The hypochlorite in solution acts in a manner similar to calcium hypochlorite as previously described. Liquid chlorine is marketed in steel cylinders holding about 100 to 125 pounds of the liquid under a pressure of about 100 pounds per square inch. Various types of apparatus have been developed for applying liquid chlorine to the water to be treated. In general these involve permitting the discharge of the chlorine from the cylinder under control and applying it in a measured amount to the water. The action of chlorine is similar to that of the hypochlorites with the exception that in the formation of hypochlorous acid no calcium or sodium salts are introduced.

In the use of chlorine and chlorine compounds for the disinfection of water it is customary to express the degree of treatment in terms of available chlorine. Commercial bleaching powder contains about 35% available chlorine, while the liquid form is practically 100% available chlorine. Five-tenths part per million, more or less, is used in the treatment of water. The amount required depends upon the pollution and physical quality of the water. The amounts used in this country vary from about two-tenths part per million to two parts per million, the latter being used in the treatment of the turbid Missouri River water. For clear waters it is generally found that one-half part per million is sufficient.

It is important to observe that the disinfection action is one of oxidation and not chlorination, as it is frequently expressed. While the chlorine is the important agent necessary to effect oxidation, the oxygen itself is the agency which destroys the bacteria.

In the use of bleaching powder it is customary to dissolve the chemical in a proportion to give a solution of about 1% strength, that is, 1 lb. of bleaching powder to 100 pounds of the solution. This solution is stored and applied to the water through various types of measuring and controlling devices.

The efficiency of chlorine in its various forms as an agency of disinfection of water has been firmly established by analytical results

and by typhoid fever statistics in communities in which it has been used. It does not, however, take the place of filtration as a method of purification of water supplies. The treatment does not affect the appearance of the water and has no beneficial effect upon chemical quality. The province of its use is limited and it is not to be considered a universal remedy for all polluted water supplies. It is the consensus of opinion among water supply experts that it is most properly adapted as an adjunct to filtration and as an emergency method of rendering a polluted water safe for use. Several state boards of health, including those of Minnesota and Kansas, have devised portable outfits for the emergency treatment of polluted water supplies. These outfits are transported and used temporarily to check typhoid fever outbreaks. This method of disinfection is also available as a means of purifying private and camp water supplies. It has been proposed to use capsules of hypochlorite for the disinfection of small quantities of water used for drinking purposes in the household, by travelers and in temporary camps.⁸ It should be observed that the use of capsules for rendering a polluted water supply safe for drinking purposes is subject to considerable uncertainty depending upon the application of proper amounts of the chemical and upon the characteristics of the water treated.

Lime. Quick lime, CaO , has been used in the treatment of water for a number of years. For excessively hard waters it has been used for softening purposes and for very soft waters of high acidity it has been employed to correct corrosive action. In the treatment of the water supply of London it became apparent that the use of lime was of assistance in securing bacterial efficiency. In 1911²⁸ extensive studies were carried on by Dr. A. C. Houston, Director of Water Examination of the Metropolitan Water Board, which led to the conclusion that treatment of the water by quick lime in an amount sufficient to cause an excess of CaO of .007% resulted in the destruction of *B. coli* in from 5 to 24 hours. Dr. Houston attributed this disinfection action to the toxic effect of the lime and therefore advanced a method of treatment of water which had previously not been recognized. He proposed that about 75% of the water supply should receive the excess lime treatment, the caustic alkalinity being neutralized by the addition of 25% of the total supply comprising water previously purified by storage or disinfection by some other agent. At the water softening plant in Columbus lime treatment has been employed continuously. The same efficient bacterial results reported by Houston have been noted by Mr. C. P. Hoover, chemist in charge²⁹ of the Columbus plant. These results have been attributed not neces-

sarily to the toxic effect of the excess lime or caustic alkalinity, but to the natural death of the organisms following the depletion of free carbonic acid resulting from the lime treatment. It is stated that the excess lime treatment is unnecessary and that equally efficient results are secured by treatment with lime sufficient to neutralize the free and half-bound carbonic acid in the water.

While this method of disinfection of water has been carefully studied, several important features of the treatment remain to be demonstrated. Its bacterial efficiency has been shown, but its universal applicability has not been proven. The principal objection which has been advanced relates to the cost of the treatment necessary to secure disinfection. In this connection, however, due credit should be given to the beneficial softening effect also produced by the treatment. Its use as an available method for purification of water supplies for private use has not been demonstrated.

The Ultra Violet Ray. The application of artificial light as a method of water disinfection was studied as early as 1878. The use of the ultra violet ray for this purpose has, however, been a development of recent years. About 1908, following extensive studies at the Sorbonne, Paris, a mercury vapor arc inclosed in a fused quartz lamp was developed.³⁰ This lamp permits the passage of the ultra violet ray into the water which is passed within a few inches of the arc. By the action of the ultra violet ray it is claimed that bacterial organisms are killed. The method has been used for several public water supplies and in numerous hospitals, clubs, railway stations and private residences abroad. Data have been presented to show the efficiency of the treatment when a clear sparkling water is handled. It is important to observe that the efficiency depends upon the freedom of the water from turbidity or dissolved color. The Austrian army uses a special field apparatus for pumping, filtering and sterilizing by means of the ultra violet ray the drinking water for troops. In this country the ultra violet ray, as an agency for disinfection of water, has not been extensively adopted. A water company in Chicago filters and disinfects by the ultra violet ray water obtained from the municipal supply and markets the same as a drinking water of satisfactory hygienic quality.³¹

An installation is now being made at Corning, New York, for the treatment of the municipal supply and it is to be hoped that accurate data on the efficiency and cost of the process will soon be available. The advantages claimed for this method of disinfection are that it is efficient and easily operated, and that no chemical is introduced into the water supply. The principal objection to its use has been the

excessive cost involved, which has apparently made it an impracticable method in comparison with other agents of disinfection. (Additional references 32-33.)

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WATER SOFTENING BY THE PERMUTIT SYSTEM.

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The sodium permutit system of softening water is unique in that it is entirely different from the old lime and soda-ash method.

The process has, without doubt, practical advantages, but, like all new inventions, it has limitations, and will not in the opinion of writers, entirely replace the lime soda-ash method, as was so freely predicted several years ago.

In this paper it is the desire of the writers to recount briefly the results of the experiments made in the laboratory of the Columbus water softening and purification works, with this new water softening agent.

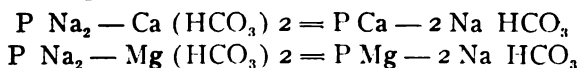
Permutit is an artificial zeolite, or hydrated sodium silicate of the following composition:



The material is very porous and granular and is made by fusing a mixture of feldspar, kaolin, sand and soda. Water is softened to zero hardness by simply filtering it through a bed of this material.

The calcium and magnesium salts in the water are not precipitated as in the lime soda-ash method, but are replaced by sodium from the permutit. When the permutit has exchanged its sodium for calcium and magnesium to the economic limit, it can be regenerated by treatment with a solution of common salt (sodium chloride) thus reconverting the calcium and magnesium permutit back to sodium permutit.

If the raw water to be softened, contains say, 245 parts per million temporary hardness, or hardness due to bicarbonates of calcium and magnesium (this is the maximum temporary hardness of the Scioto River water at Columbus for the past 5 years), the filtrate from the permutit filter will contain an equivalent quantity of sodium bicarbonate, the sodium permutit being changed to calcium and magnesium permutit according to the following reaction:



Calcium and magnesium sulphates are changed to sodium sulphate; thus if the total hardness of the water to be softened is 450

parts per million, (maximum hardness Scioto River water) the permutit softened water will contain the equivalent of this hardness in the form of sodium salts.

Inadequacy of the Lime-Soda-Ash Method for Softening Scioto River Water. When the hardness of the Scioto River water exceeds 350 parts per million, it is very difficult to reduce it to less than 100 parts, by the use of lime and soda-ash, because these chemicals combine with the magnesium present in the water and form a colloidal basic carbonate, which is not removed from the water unless precipitated with aluminum sulphate or some other coagulant.

The citizens of Columbus seem to be satisfied with the water when its hardness does not exceed 75 or 80 parts per million, but some of them notice the difference when the hardness reaches 95 or 100 parts, and as the softened water has a hardness of approximately 100 parts per million for several months each year, any water softening process that would insure a softened water of a uniform degree of hardness would be welcomed.

Knowing something of the possibilities of permutit, and deciding to give it a thorough trial a small quantity of the material was secured from the Permutit Company, 30 E. 42nd St., New York City. A small experimental filter was installed, using a large burette as a container.

Results Secured in Softening Raw River Water With Permutit.

Raw Scioto River water was first filtered through this medium, with the following results:

Typical analysis of Scioto River before and after softening with permutit:

Results expressed as parts per million in terms of Ca CO_3 .

	Raw	Softened
Total Alkalinity	180	185
Bicarbonate Alkalinity	180	147
Normal Carbonate Alkalinity	0	38
Incrustants (permanent hardness)	200	Negative 182
Total Hardness	380	0

The results of analysis of a number of samples of river water softened by permutit indicate, that it would not be a satisfactory water for municipal consumption.

It was thought that perhaps permutit could be used to advantage by simply using it as a finishing process and, briefly, the plan was as follows:

1st. Treat with lime, say 75% of the water to be softened, and thus remove most of the temporary hardness.

2nd. Soften the balance, or 25%, with permutit. This treatment would remove all of the hardness of this portion and also charge it with excess soda.

3rd. Mix the 75% lime-softened water, having high permanent hardness, with the 25% permutit-softened water containing excess soda. The idea in doing this is that the excess soda of the permutit-softened water would react with the permanent hardness of the lime-softened water, and thus produce a satisfactorily soft water free from carbonate of sodium. It was soon discovered, however, that the sodium present in the permutit-softened water was in the form of sodium bicarbonate, and would not react with the permanent hardness, and for that reason the plan failed.

The plan was then modified as follows:

1st. Soften all the water with lime, thus converting the bicarbonates to normal carbonates; then pass a portion of this lime-softened water through permutit, and instead of obtaining a softened effluent containing bicarbonates, the effluent should contain normal carbonates of sodium (because the lime-softened water contains no free and half-bound carbon dioxide to combine with the soda to form sodium bicarbonate), and it was felt that there would be no trouble in neutralizing this excess sodium carbonate with lime-softened water containing permanent hardness.

Typical analysis of lime-softened water before and after softening with permutit:

Results expressed as parts per million in terms of Ca CO_3 :

	<i>Before softening with permutit.</i>	<i>After softening with permutit.</i>
Total Alkalinity	35	56
Bicarbonate Alkalinity	0	0
Normal Carbonate Alkalinity	34	50
Caustic Alkalinity	1	0
Incrustants (permanent hardness)	145	Negative 55
Total Hardness	180	0

It will be noticed by referring to the above table, that the permutit lime-softened water contains 55 parts excess soda, as shown by the negative, or minus, permanent hardness, and that it contains no bicarbonate alkalinity, and yet when this water is mixed with lime-softened water containing permanent hardness no reaction takes place. We are not as yet able to offer a satisfactory explanation.

Permutit as a Finishing Process. Water was first softened with lime and soda-ash and then filtered through permutit as a finishing process. The following results were obtained:

Results expressed as parts per million in terms of Ca CO_3 :

	PERMUTIT SOFTENED.		
	<i>Lime and soda ash softened</i>	<i>Permutit freshly regenerated.</i>	<i>Permutit nearly exhausted.</i>
Total Alkalinity	56	105	62
Bicarbonate Alkalinity	6	3	14
Normal Carbonate Alkalinity	50	103	48
Caustic Alkalinity	0	0	0
Incrustants (permanent hard- ness)	35	Minus 101	Minus 64
Total Hardness	91	0	0

The results show that permutit used even as a finishing process produces a water with large quantities of excess sodium carbonate.

Permutit Not Soluble. When distilled water is passed through permutit it becomes slightly alkaline, showing the following analysis:

Results expressed as parts per million in terms of Ca CO_3 :

	<i>First 1000 c. c. portion</i>	<i>30th 1000 c. c. portion</i>
Total Alkalinity	95	29
Bicarbonate Alkalinity	35	9
Normal Carbonate Alkalinity	60	20

This alkaline reaction develops in the distilled water when passed through permutit, even after the filter has been exhausted and regenerated a number of times, indicating that possibly the permutit is soluble. A filter containing exactly 136 grams of permutit was subjected to the action of filtered water for 552 continuous hours, during which time 1,000 gallons of water passed through it. The permutit was then carefully dried and weighed, but there was no loss in weight, showing that the permutit is not soluble, or at least not soluble in the water used.

The Composition of Permutit Before and After Exhaustion. When hard water is passed through a permutit filter, the calcium and magnesium, as has already been explained, are exchanged for sodium, and after a while the permutit becomes exhausted and it is necessary to regenerate it, when it has exchanged its sodium for calcium and magnesium to the economic limit. After the experimental filter had been worked to its limit, a chemical analysis was made of a sample of

permutit taken from the top layer of the filter, and also of a sample taken from the bottom of the filter.

Analyses of samples of regenerated permutit, exhausted permutit from the top of the filter bed, and exhausted permutit from the bottom of the filter are shown in the following table:

Percent Sodium Oxide (Na_2O) in regenerated permutit.....	14.09
Percent Sodium Oxide (Na_2O) in top layer permutit.....	4.36
Percent Sodium Oxide (Na_2O) in bottom layer permutit.....	8.87

In the top layer, the above analysis shows, 69% of the sodium available for replacing calcium and magnesium, whereas only 37% of the sodium in the bottom layer is available.

Regeneration. It is very difficult to completely regenerate permutit after it has become exhausted. Subjecting the material to a single regeneration treatment does not completely remove the calcium and magnesium.

In one instance the exhausted permutit was subjected to 10 regenerations of 20 hours each, using 20% salt solution. The results obtained by each regeneration are shown in the following table:

<i>Regeneration Number.</i>	<i>Percent of total removal.</i>
1	54.36
2	19.70
3	10.81
4	5.80
5	4.41
6	1.31
7	1.71
8	0.83
9	0.53
10	0.53

A study was made of the various modifications of regenerating permutit, regenerations being made with 2½, 5 and 10% solutions, using both chemically pure and commercial salt. Solutions were used both hot and cold, and the solutions were given from 4 to 24 hours contact. The results of these experiments showed:

1st. That a 10% salt solution is more effective than a 5% solution. Ten regenerations were made using 10% salt solution and the regenerated material softened, on an average, 11,825 cubic centimeters of water before becoming exhausted, whereas five regenerations were made using a 5% solution, yielded an average of only 8,530 c. c.

2nd. Commercial salt (containing 0.5% calcium and 0.01% magnesium) proved to be as effective for regenerating as chemically pure sodium chloride.

3rd. Four-hour periods of regeneration were as effective as twenty-four hours.

4th. Cold solutions of salt proved to be as effective as hot solutions.

The following table shows results obtained by regenerating with 2½, 5 and 10% salt solutions, hot and cold solutions, chemically pure and commercial salt solutions, and also the amount of calcium and magnesium removed from the permutit and from the raw water, and also the yield of softened water after each regeneration.

RESULTS OBTAINED BY VARIOUS METHODS OF REGENERATION.

The series was started with 0.635 pounds of fresh permutit. Rate of filtration was 7 feet per hour.

Regeneration Number.	Strength of Na Cl Solution.	Hot or Cold Na Cl Solution.	Chemically Pure or Commercial Na Cl Solution.	Time of Regeneration, Hours.	Grams of Calcium and Magnesium Removed from Permutit.	Grams of Calcium and Magnesium Removed from Raw Water.	C. C. M. of Raw Water of 392 P. M. Hardness Softened to Zero Hardness, After each Regeneration.
					Fresh Permutit.		
1.....	10 %	Cold	Pure	4	3.54	16.91	40,820
2.....	10 %	Cold	Pure	22	4.29	8.87	19,770
3.....	10 %	Hot	Pure	4	4.84	6.75	12,100
4.....	10 %	Hot	Pure	4	3.42	5.04	10,280
5.....	5 %	Cold	Pure	4	3.42	5.20	10,690
6.....	5 %	Cold	Pure	24	3.39	4.94	10,410
7.....	5 %	Cold	Pure	4	3.35	5.25	10,480
8.....	2½ %	Cold	Pure	4	2.41	4.02	0
9.....	2½ %	Cold	Pure	24	1.95	3.33	400
10.....	5 %	Cold	Pure	4	4.18	3.53	6,210
11.....	5 %	Cold	Pure	4	3.77	3.52	4,990
12.....	10 %	Cold	Pure	18	7.42	4.26	8,200
13.....	10 %	Cold	Pure	18	5.61	6.38	14,520
14.....	5 %	Cold	Pure	4	3.66	5.84	12,480
15.....	5 %	Cold	Pure	4	4.60	3.75	6,610
16.....	10 %	Cold	Impure ...	4	6.06	5.09	10,480
17.....	10 %	Cold	Impure ...	4	5.54	5.11	11,400
18.....	10 %	Cold	Impure ...	4	5.39	6.77	16,040
19.....	10 %	Cold	Impure ...	4	5.75	3.32	6,770
	10 %	Cold	Impure ...	4	5.15	5.48	12,520

All of the sodium oxide (Na_2O) in permutit is not available for producing zero hardness water.

Calcium and magnesium can be almost completely removed from the water by the lime-soda-ash method if these reagents are added in

large excess, but this, of course, is not permissible as the presence of this excess chemical in the softened water would very probably be more objectionable than the hardness.

The permutit system takes advantage of the law of mass action, however, by employing a large excess of an insoluble reagent, sodium permutit, instead of soluble reagents as soda ash and lime.

As has been said before, the permutit filter is not operated until it is entirely exhausted, because the ability of the filter to produce zero water depends entirely on the presence of excess reagent, and if it is desired to produce zero hardness water the filter must not be entirely exhausted, and therefore all the sodium oxide (Na_2O) present in the permutit is not available for softening, if it is desired to produce water of zero hardness.

Theoretically one pound of permutit should soften to zero hardness 305 gallons of water, having a hardness of 100 parts per million.

One pound of permutit regenerated with 10% salt solution will actually soften to zero hardness, according to our experiments, 19.3 gallons of water having 100 parts per million hardness.

This means that in figuring the quantity of permutit necessary to soften a given number of gallons of water of a definite degree of hardness, that approximately 16 times the theoretical quantity should be obtained.

Quantity of Salt Required for Regeneration. The average results of 19 experiments show that 32.9 grams of salt are required for softening 11,825 cubic centimeters of water of 392 parts per million hardness.

Quantity of Water Needed to Wash Excess Salt From Regenerated Permutit. After the regenerating brine is drawn from the permutit filter the excess salt is washed out of the filter with raw water. Ordinarily a volume of raw water equal to the volume of permutit is sufficient to wash out practically all of the excess salt.

Rate of Filtration. The raw water used in the experimental filter had a maximum total hardness of 392 parts per million, and the highest efficient rate of filtration obtained was seven (7) feet per hour, or 55 million gallons per day per acre.

Comparison of Cost of Softening With Lime and Soda-Ash and With Permutit. At the Columbus water softening and purification plant during the year 1912 the hardness of the Scioto River water was reduced from 222 parts per million to 79 parts per million.

The cost of lime and soda-ash necessary to accomplish this was \$6.54 per million gallons, which would figure \$4.57 per million gallons for the removal of 100 parts per million of hardness.

According to the results outlined in a previous paragraph, 5,920 lbs. of salt are necessary to remove 100 parts per million of hardness for one million gallons of water. Salt can be purchased in Columbus for \$3.50 per ton, so that the cost of removing 100 parts of hardness would be \$8.61 as against \$4.57 with the lime-soda-ash method.

Advantages of the Permutit Process. 1st. It is the only practical process, known to the writers, by which water of a zero hardness can be produced on a large scale.

2nd. Only one chemical is needed (common salt).

3rd. Variations in the hardness of raw water are automatically taken care of.

4th. There is no sludge to be removed.

Disadvantages. 1st. Cost of operation is higher than with lime and soda-ash.

2nd. Water to be softened must be perfectly clear, for if it contains any turbidity the pores of the permutit become clogged.

3rd. The permutit-softened water contains residual sodium bicarbonate, and if used for boiler feed purposes may cause trouble by foaming.

THE SANITARY SURVEY, WHAT IT IS.

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The problem which confronts all social as well as all public health workers is centered largely in the education of the masses in regard to the importance of improving conditions which surround them. It has been ignorance which has held back the strides of progress more than any other one thing and has contributed almost entirely to the ravages of preventable disease and poverty. Both rich and poor, and in many cases both so-called educated and uneducated people are to a great extent, ignorant of the big problems of public health work. The question of education is, therefore, being more intensely considered day by day by public health workers in their efforts to secure better living conditions and more sanitary surroundings. An honest effort is being made by the State Board of Health to bring the reasonableness of public health work in all its phases to the attention of the people of Ohio.

The old saying that "you can't teach an old dog new tricks" holds good in the present case. The difficulties encountered by the State Department of Health in securing the interest of the adult population

of the state is rather amazing. The younger people, the school children, however, are extremely interested in all questions relating to sanitation and hygiene. Every effort should, therefore, be made to encourage the school children in their study of and interest in the questions of public health.

Teachers should be able to furnish information to all who come for instruction. Public health lectures and exhibits both in school and for the general public disseminate the needed information. Public health work is not as intricate and complex as many suppose and is entirely governed by the rule of reason. It does not take long for the people to appreciate the value of a pure water supply, proper sewerage, good plumbing, quarantine, vaccination, the betterment of working conditions, the care of babies, prevention of blindness, the medical inspection of school children, and the proper collection and disposal of municipal refuse, when once they are properly informed as to the advantages and necessity of such public health work.

The problem, as stated before, is one of education and the day has come when a mere statement is not sufficient to convert the people to the idea that it is necessary to expend money in securing such improvements. It is necessary that additional facts and data be secured for presentation to them. Take in your own community, how many people do you suppose are familiar with the insanitary conditions which exist? There is not a community in the state that has not some objectionable condition or conditions which should be improved. Many health officers are not familiar with the conditions as they exist. They have had a much better opportunity, however, to familiarize themselves with the existing situation. Some systematic method of investigation is necessary. The information secured must be carefully kept in note books, tabulated and presented to the people who are responsible.

The sanitary survey is made in the effort to secure information and data which will show, not only the satisfactory conditions, but also those which are objectionable and which should be improved. Many sanitary surveys have been made with varying objects. Some are made in order to ascertain housing conditions; some are made in order to secure information concerning water supplies, the condition of streams, the collection and disposal of municipal refuse, the physical condition of school children, the prevalence of blindness and the possibility of preventing a large portion of it by the proper treatment of babies at the time of birth. Many cities have inaugurated a complete sanitary survey taking up for consideration all of these various problems. It requires a great deal of time, energy and money to carry on

such a survey and unless some beneficial results are obtained it must be considered as a serious waste. In the majority of cities, however, where such surveys have been made the improvement of conditions has been marked and the people have been more than satisfied with the results obtained. In many localities it is possible to enroll the school children in the sanitary survey. In Chicago, recently, the children of the various schools were divided into squads and each given a district to inspect. During the work over 2,200 city blocks were carefully inspected, all conditions noted in note books, the number of privies, the number of cesspools, the number and character of houses and outbuildings, the condition of streets and alleys, and similar data. It was necessary before this work was started to have a plan with outline carefully prepared. This was done by members of the City Health Department and Recreation Department. As the work was completed the data was brought to the school buildings and there tabulated in proper form, so that it was readily accessible to both the Recreational Department and Department of Health. The school children employed in this work were extremely interested and have formed themselves into an organization which will attempt to secure the improvement of all objectionable conditions observed in their respective districts.

At the Conference of the State and Provincial Boards of Health of North America, it was decided to ask that each state or province represented make a sanitary survey of a county unit. The State Board of Health decided to make such a survey, and after statistical studies made in order to secure a representative county, it was determined to make an intensive sanitary survey of Stark County. After the statistical studies were made showing the principal points of interest in connection with the county, a general outline was prepared in order that a definite understanding and idea would be available before the work was started, showing exactly what was to be done and what information secured.

Following the general outline, a detailed outline was prepared by a representative of each Division of the State Board of Health. The detailed outline is exactly what the name implies and takes up the various points of particular interest to the Division making the survey. Work is in progress at the present time on the survey for Stark County. The rural schools have been inspected, conditions of the buildings noted, the lighting, heating, ventilating, character and size of desks, water supply, outside closets, play grounds and the general physical condition of the school children. The conditions are rather surprising, and it is hard to understand how it is possible in a com-

munity, such as Stark County is, to find so many poor school buildings and insanitary conditions surrounding them. Another point brought out by the survey so far, is the fact that the schools in the various townships are much different. In one township which I have in mind, the health officer and trustees are inactive, so far as health work is concerned. Nevertheless the township board of education have the school buildings in excellent condition, well heated, well lighted; the children are provided with individual drinking cups, paper towels are provided, the privies have modern water tight vaults and each school building has a well. In an adjoining township the school buildings are old and dilapidated, are in need of repair, the light is bad, the privies are of the surface type and have not been cleaned. Not a school in the particular township now in mind has a well, and the nearest well to some of these buildings is at least three-quarters of a mile away and the water is carried to the school every other day. Fresh water is scarcely, if ever, available, and the children must frequently do without water from the time they reach school until they arrive home in the evening. It is a well known fact that the majority of us drink entirely too small an amount of water. Children who are growing and who are working in school need proper food and plenty of pure water. Their physical condition would be much improved provided a suitable water supply was available so that fresh water could be obtained at any time. It is unnecessary to give in more detail what has been found in Stark County, for the above is sufficient to give an idea of what conditions have been found. When these conditions are brought to the attention of the people residing in the district it would seem that immediate steps would be taken to secure an improvement. The district in which the poor school houses are found is a rich agricultural district; the farm houses are all in good repair, well painted and well kept up. The barns are large and in good condition. It does not seem possible that people provided with the conveniences of life at home would place such objectionable conditions about their children at school. Much more attention is paid to the construction of lodge rooms, literary halls and churches than is paid to the school buildings, nevertheless the school buildings are almost continuously used during eight or nine months of the year, while the churches and lodge rooms are used only occasionally. The reason I dwell upon the condition of the school buildings is in order to give you an idea of what information we are securing concerning other departments of the county community. As stated above the work is not yet complete but it is hoped and an effort is being made to secure a comprehensive survey of Stark County, not only of the rural districts, but of the vil-

lages and cities. When this is secured and printed it will form a basis for other sanitary surveys of greater or lesser extent which may be conducted by the local health departments, the county board of education or any other body of people interested in social or health work. It is only by securing the information and presenting it to the people of any community that improvements can be secured. It is only, then, through education that we can hope to secure the best and most lasting improvements in sanitation. Until we have the people educated and a desire created for better sanitary and living conditions it will be impossible to secure the co-operation of the people in the enforcement of existing laws. A law which does not have the support of the community is practically a dead letter. It is necessary, therefore, to secure the co-operation of a majority of the people in any community before we can expect to make much of an impression in improved sanitation.

A SURVEY OF INDUSTRIAL HEALTH-HAZARDS AND OCCUPATIONAL DISEASES IN OHIO.

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(Continued from the July issue.)

INDUSTRIES HAVING A KNOWN ASSOCIATION WITH DUST.

Comment.—The chief health-hazard of the industries considered here is DUST. This does not imply that dust is not also a chief health-hazard in industries considered elsewhere, nor that dust is the only health-hazard of concern here.

BRICK AND TILE.

The Census gives 517 establishments engaged in this industry, employing a total of 7,466 wage-earners, or 1.7% of the total wage-earners in the state. Our investigations covered 9 establishments, in 7 cities, employing a total of 716 wage-earners, all males. The chief processes of health-hazardous character were found to be: (Brick) Clay Mixing and Grinding, Pressing and Kilning.

BROOMS.

The Census gives 82 establishments engaged in making brooms, employing a total of 393 wage-earners. Our investigations covered

10 establishments, in 2 cities, employing a total of 86 wage-earners, of whom 82 were males and 4 were females. The hazards of the process are stated under Broom Manufacture.

CEMENT.

The Census gives 9 establishments engaged in cement making, employing 887 wage-earners, or 0.2% of the total wage-earners in the state. Our investigators covered 2 establishments, in 2 cities, employing 162 wage-earners, all males. The hazards are considered under the heading "Cement Making."

COOPERAGE AND WOODEN GOODS.

(Not specified elsewhere.)

Under this heading the Census gives 113 establishments, employing a total of 1,663 wage-earners, or 0.4% of the total wage-earners in the state. Our investigations covered 1 establishment, employing 390 wage-earners, all males. The chief processes of health-hazardous character were found to be: Wood-working; also Forging and Blacksmithing, Machine Shopping, Metal Grinding, Sandblasting, and Painting. In addition to the above figures, our investigations covered this industry in a large number of establishments where it was auxiliary to their principal processes. As noted from the processes named, there is nothing hygienically peculiar to the industry as such.

CORDAGE, TWINE, JUTE AND LINEN GOODS.

The Census give 8 establishments engaged in this industry, employing a total of 791 wage-earners, or 0.2% of the total wage-earners in the state. Our investigations covered 5 establishments, in 3 cities, employing a total of 510 wage-earners, of whom 434 were males and 76 were females. The chief processes of health-hazardous character are considered under the head of Cordage Making (Breaking, Spreading, Drawing, etc.), Spinning, Rope and Twine Making, and Finishing.

EMERY AND OTHER ABRASIVE WHEELS.

The Census gives 3 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 2 establishments, in 2 cities, employing a total of 112 wage-earners, all males. The chief processes of health-hazardous character were found to be: Emery Mixing, Emery Wheel Truing, Furnacing, Babbitting.

FLOUR AND GRIST MILL PRODUCTS.

The Census gives 673 establishments engaged in this industry, employing a total of 2,585 wage-earners, or 0.6% of the total wage-earners in the state. Our investigations covered but 2 establishments, employing a total of 85 wage-earners, all males. As flour itself is practically a harmless dust, and occupational complaints are very rarely reported from this type of industry, we did not take time to investigate this line further. Cooperage is an auxiliary process, and is considered elsewhere. The manufacture of cereal products is not considered here.

GRINDSTONE.

The Census gives 9 establishments engaged in this industry, employing 1,277 wage-earners, or 0.3% of the total wage-earners in the state. Our investigations covered this process in 4 establishments, in 3 cities, employing 878 at this process. The balance of the workers are considered under Marble and Stone Workers.

MARBLE AND STONE.

The Census gives 198 establishments engaged in this industry, employing a total of 2,012 wage-earners, or 0.5% of the total wage-earners in the state. Our investigations were directed principally to the Sawing and Finishing of Stone, Monuments, and Grindstones, rather than to Quarrying, and covered 19 establishments, in 5 cities and vicinities, employing a total of 705 wage-earners, all males. The chief processes of health-hazardous character were found to be: Surfacing, including Designing and Polishing, Sawing, Cutting, Machine Shopping, Forging and Blacksmithing, and the Making of Grindstones.

According to the Ohio Vital Statistics Reports, there were, for the years 1910, 1911 and 1912, 163 deaths reported among Marble and Stone Cutters, of which number 45 deaths were due to pulmonary tuberculosis, or 27.61% of their total deaths. This rate is to be compared to the pulmonary tuberculosis death rate of all occupations in the State combined, for the same years, which was 13.3%; and is also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

MATTRESSES AND BED SPRINGS.

The Census gives 38 establishments engaged in this industry, employing 961 wage-earners, or 0.2% of the total wage-earners in the state. Our investigations covered 6 establishments, in 5 cities, employ-

ing a total of 205 wage-earners, of whom 152 were males, and 53 were females. The chief processes of health-hazardous character are given under Mattresses and Feathers, Sewing and Finishing.

PAPER AND WOOD PULP.

The Census gives 47 establishments engaged in this industry, employing 4,673 wage-earners, or 1.0% of the total wage-earners in the state. Our investigations covered 13 establishments (exclusive of Roofing Materials), in 7 cities, employing a total of 2,967 wage-earners, of whom 2,304 were males and 663 were females. The chief processes of health-hazardous character were found to be: Rag Sorting, Paper Beating, Paper Machining, Printing, Forging and Blacksmithing, Mixing Chemicals, Sewing, Engraving, Gluing and Pasting.

WOOD, TURNED AND CARVED.

The Census gives 83 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 2 establishments, in 1 city, employing a total of 85 wage-earners, of whom 81 were males and 4 were females. (See also Furniture and Refrigerators.) The chief processes of health-hazardous character were found to be: Wood-working, Shellacing and Lacquering, Staining, and Factory Processes.

INDUSTRIES IN WHICH FATIGUE, MONOTONY OR INACTIVITY ARE PRINCIPAL HEALTH-HAZARDS.

BOOTS AND SHOES.

The Census gives 72 establishments engaged in this industry, employing a total of 16,026 wage-earners, or 3.6% of the total wage-earners in the state. This is the fifth industry in importance in the number of wage-earners employed in the State. Our investigations covered 29 establishments, in 9 cities, employing a total of 11,806 wage-earners, of whom 6,727 were males and 5,079 were females. The chief processes of health-hazardous character were found to be: Leather Cutting, Fitting, Lasting, Finishing and Packing.

According to the Ohio Vital Statistics Reports, there were 121 deaths reported during the years 1910, 1911 and 1912, among male Boot and Shoe Factory Operatives, of which 31 were due to pulmonary tuberculosis, or 25.62% of their deaths. According to the same Reports, there were only 31 deaths reported among female Boot and Shoe Factory Operatives, but of these 18 were due to pulmonary tubercu-

losis, or 58.06% of their deaths. The numbers of deaths are too small to be given much significance. These rates may be compared to the pulmonary tuberculosis death rate of all occupations in the State combined, for the same years, which was 13.3%; and also may be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

The following paragraph is taken from the Cincinnati Tuberculosis Hospital Report for the year 1912:

"Twenty-seven shoemakers were admitted. This occupation seems to be especially dangerous. Ninety-five per cent of the Union Shoemakers who died in Cincinnati in 1912 died of tuberculosis. These men work at benches in teams of five, the unfinished product being passed to the next man and so on. Each man occupies about two and one-half feet of the bench. Any infected case, talking or coughing, ejects a spray of saliva which is inhaled by his neighbor. This man is known as a tuberculosis carrier."

CLOTHING AND TEXTILE MANUFACTURING.

(Including Cotton and Woolen Goods.)

While Men's and Women's Clothing are separately considered in the Census, there is no sufficient reason for considering them separately in this report. According to the Census, the combined industries represent 495 establishments, with a total of 18,793 wage-earners, making it the fourth in importance in the number of wage-earners in the state. It employs 4.2% of the total wage-earners. If the Cotton Goods, including 4 establishments with 177 wage-earners, and the Woolen Goods, including 20 establishments with 2,566 wage-earners, are added, the Clothing and Textile Manufacturing Industry becomes the third in point of wage-earners in the State. Our investigations covered only a very small part of this field, but we have endeavored to spread out the inquiry into enough branches of the industry to give the chief hygienic facts. Our investigations covered 17 establishments, in 6 cities, employing a total of 7,158, of whom 2,277 were males and 4,881 were females. The smallest place seen employed 32 workers, the largest, 1900. The chief processes of health-hazardous character are conveniently grouped as follows: Wool Sorting, Washing (including scouring, drying, shrinking), Carding (with combing, warping, twisting, winding and spinning; napping and fleecing), Weaving and Knitting, Sewing, Ironing and Pressing, Cutting Cloth, and General Factory Processes, such as cleaning, finishing, burling, mending, splicing, inspecting, packing, boxing, etc. Designing is about the same as elsewhere described.

According to the Ohio Vital Statistics Reports, there were in the years 1910, 1911 and 1912, 522 deaths reported among male tailors, of which 90 were due to pulmonary tuberculosis, or 17.25% of their deaths. According to the same Reports, there were 610 deaths among females (tailoresses, dressmakers and seamstresses), 138 of which were due to pulmonary tuberculosis, or 22.62% of their deaths. There were, in addition, some deaths from tuberculosis of other parts than the lungs, making the total tuberculosis death rate still higher. These rates are to be compared to the pulmonary tuberculosis death rate of all occupations in the State combined, for the same years, which was 13.3%; and are also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

FLAGS, BANNERS, REGALIA, BADGES AND EMBLEMS.

The Census gives 13 establishments engaged in this industry, employing a total of 1,262 wage-earners, or 0.3% of the total wage-earners in the state. Our investigations covered 2 establishments, in 2 cities, employing a total of 949 wage-earners, of whom 340 were males and 609 were females. The chief processes of health-hazardous character were found to be: Sewing, Ironing and Pressing, Cutting Cloth, Brass Founding, Electroplating, Polishing and Buffing, Shellacing and Lacquering, Painting and Varnishing, Bronzing, Artist's Work (see Printing), Wood-working, Gluing and Pasting. Our attention was drawn to some sickness complaints among one or two felt hat workers, but an industrial relationship could not be established. Investigations showed that they were slightly exposed to ammonia, but not to mercury, as was feared.

IRON AND STEEL BOLTS, NUTS, WASHERS AND RIVETS.

(Not Made in Steel Works or Rolling Mills.)

The Census gives 17 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 4 establishments, in 2 cities, employing a total of 1,584 wage-earners, of whom 1,090 were males and 494 were females. The chief processes of health-hazardous character were found to be: Forging and Blacksmithing, Tempering, Galvanizing, Electroplating, Furnacing, Machine Shopping and Wire Manufacture.

TOBACCO MANUFACTURE.

The Census gives 1,146 establishments engaged in this industry, employing a total of 12,631 wage-earners, or 2.8% of the total wage-earners in the state. This appears to be the eight industry in point of wage-earners in the state. Our investigations covered 27 establishments, in 13 cities, employing a total of 6,254, of whom 1,791 were males and 4,463 were females. This industry is one of the largest female-employing in the state. The chief processes of health-hazardous character were found to be: Tobacco Moistening, Stemming, Rolling, and Miscellaneous Processes.

According to the Vital Statistics Reports there were, for the years 1910, 1911 and 1912, 261 deaths among male Tobacco and Cigar Factory Operatives, of whom 50 died of pulmonary tuberculosis, or 19.15% of their deaths. The industrial reports for females were too incomplete to be taken as representative, but of 36 authentic deaths reported, 16 were due to tuberculosis, or 44.44%. The Mortality Statistics of the U. S. Census for the Registration Area in 1909 gives the pulmonary tuberculosis death rates for male Tobacco and Cigar Factory Operatives as 24.3%, and for females as 40.5%.

INDUSTRIES IN WHICH HEAT, COLD, MOISTURE AND DAMPNES ARE THE CHIEF HEALTH-HAZARDS.**BAKERIES.**

The Census gives no statistics concerning this industry. Our investigations covered 8 establishments, in 3 cities, employing a total of 974 wage-earners, of whom 653 were males and 141 were females. The chief processes of health-hazardous character are considered under the head of Baking Processes. A large number of the workers are engaged in what may be considered ordinary Factory Processes.

CANNING AND PRESERVING.

The Census gives 107 establishments engaged in this industry, employing a total of 2,009 wage-earners, or 0.4% of the total wage-earners in the state. However, these are pre-eminently short-season workers. Our investigations covered 13 establishments, in 11 cities, employing a total of 1,346 wage-earners, of whom 685 were males and 661 were females. The chief processes of health-hazardous character were found to be: (Vegetable) Preparing and Cooking, and Filling and Sealing.

CARBONATED WATERS AND SOFT DRINKS.

The Census gives no figures concerning this industry. Our investigations covered 3 establishments, in 2 cities, employing a total of 24 workers, all males. The processes of concern were (Carbonated Water) Compounding and Bottling.

CONFECTIONERY.

The Census gives 114 establishments engaged in the manufacture of confections, employing a total of 2,493 wage-earners, or 0.6% of the total wage-earners in the state. Our investigations covered 14 establishments in 3 cities, employing a total of 1,266 wage-earners, of whom 362 were males and 904 were females. The chief processes of health-hazardous character were found to be: Confectionery Processes and Chocolate Dipping.

GLASS MANUFACTURE.

The Census gives 45 establishments engaged in this industry, employing a total of 10,159 wage-earners, or 2.3% of the total wage-earners in the state, making it the eleventh industry in importance in point of employes in the state. Our investigations covered 28 establishments, in 16 cities, employing a total of 9,606 wage-earners, of whom 8,742 were males and 864 were females. Under this heading we have included manufacturers of glass table ware, bottles, shades, incandescent blubs (the blowing only), tubing, window glass, ornaments and novelties. Under a separate heading is included the industries engaged solely in glass cutting, mirror making, and art-glass manufacture. The chief processes of health-hazardous character were found to be: Glass Ingredient Mixing, Glass Blowing by Hand, Glass Blowing by Machinery, Glass Pressing, Glass Cutting, Grinding and Polishing, Glass Etching, Glass Crucible Manufacture (about the same as Sagger Making and Mold Making in Pottery, *q. v.*), and Art Glass Manufacture.

According to the Ohio Vital Statistics Reports for the years 1910, 1911 and 1912, there were 188 deaths among glassworkers, of which number 40 were due to tuberculosis, or 21.28% of the total deaths. Thirty-five of the deaths were due to tuberculosis of the lungs. This rate is to be compared to the pulmonary tuberculosis death rate of all occupations in the State combined, for the same years, which was 13.3%; and is also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

ICE MANUFACTURE.

The Census gives 97 establishments engaged in this industry, employing a total of 892 wage-earners, or 0.2% of the total wage-earners in the state. Our investigations covered 12 establishments, in 3 cities, employing a total of 280 wage-earners, all males. This does not include Ice Manufacture by Breweries (see Liquors, Malted). The chief processes of health-hazardous character were found to be: Ice Manufacturing, and, in the case of some firms, Bottling.

IRON AND STEEL BLAST FURNACES.

The Census gives 40 establishments engaged in this industry, employing a total of 7,295 wage-earners, or 1.6% of the total wage-earners in the state. Our investigations covered 6 establishments, in 3 cities (in addition to those noted in connection with Iron and Steel Rolling Mills), employing a total of 2,100 wage-earners, all males. The chief processes of health-hazardous character were found to be: Blast Furnacing and Gas-producing.

IRON AND STEEL FORGINGS.

The Census gives 30 establishments engaged in this general industry, but does not state the number of wage-earners. Our investigations covered 8 establishments, in which a large percentage of workers were engaged at forging or welding, in 5 cities, employing a total of 886 wage-earners, of whom 875 were males and 11 were females, the latter engaged in core-making. The chief processes of health-hazardous character were found to be: Iron Founding, Core-Making, Puddling, Forging and Blacksmithing, Machine Shopping, Welding, Riveting, Tempering, Wood-working.

IRON AND STEEL WORKS AND ROLLING MILLS.

The Census gives 75 establishments engaged in this industry, employing a total of 38,586 wage-earners, or 8.6% of the total wage-earners in the state; in point of wage-earners this is the second industry in the state. Our investigations covered 23 establishments, in 13 cities, employing a total of 28,195 wage-earners, all males. (These figures include 524 at galvanizing, in 7 firms.) Also the galvanizing (103 males) and tinning (104 males and 12 females) departments in 3 other large firms were seen. The chief processes of health-hazardous character were found to be: Blast Furnacing, Bessemer Furnacing, Open Hearth Furnacing, Gas-producing, Iron Founding, Brass

Founding, Welding, Tempering, Metal-Grinding, Machine Shopping, Forging and Blacksmithing, Furnacing, Hot Rolling and Shaping, Cold Rolling, Painting and Stenciling, Core-Making, Wood-working, and Chemical Manufacturing. See also Wire Manufacture, Foundry and Machine Shop Processes, Galvanizing and Tinning.

According to the Ohio Vital Statistics Reports during the years 1910, 1911 and 1912, there were 710 deaths reported among Iron and Steel Workers, of whom 72 died of pulmonary tuberculosis, or 17.69%. This rate is to be compared to the pulmonary tuberculosis death rate of all occupations in the State combined, for the same years, which was 13.3%; and is also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

(See Special Report of Sick Benefit Association of an Iron and Steel Company — Part IV., Introduction.)

LAUNDERING.

The Census gives no figures concerning this (non-manufacturing) industry. Our investigations covered 28 establishments, in 4 cities, employing a total of 2,394 wage-earners, of whom 527 were males and 1,867 were females. The chief processes of health-hazardous character were found to be: Listing, Sorting and Marking, Washing, Mangling, and Ironing. A few laundries were also engaged in Dry Cleaning and Dyeing (*q. v.*).

According to the Ohio Vital Statistics Reports during the years 1910, 1911 and 1912, there were 149 deaths among Laundresses, of which 35 were due to pulmonary tuberculosis, or 23.49% of their deaths. This rate is to be compared to the pulmonary tuberculosis death rate of all occupations in the State combined, for the same years, which was 13.3%; and is also to be compared to the pulmonary tuberculosis death rate of those engaged in Agricultural Pursuits during the same period, which was 7.13%.

A number of laundries were found to have good lunch rooms or restaurants (supplying coffee free), lockers and clothes rooms; also to have anti-spitting placards pasted up, and otherwise to take a decided interest in the health and welfare of their employes.

(*To be continued.*)

THE HYGIENE OF SPECIAL PROCESSES.

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Division of Industrial Hygiene, Ohio State Board of Health.

PRINTING. — COMPOSING ROOMS AND GENERAL JOB WORK.

This was investigated in 26 establishments, in 12 of which it was more or less of an auxiliary feature. The lines of business were printing and publishing, manufacture of boxes, art, glass, painting and varnishing, paper goods, matches and electrotyping. In these places there were employed a total of 513 wage-earners of whom 385 were males and 128 were females. Methods

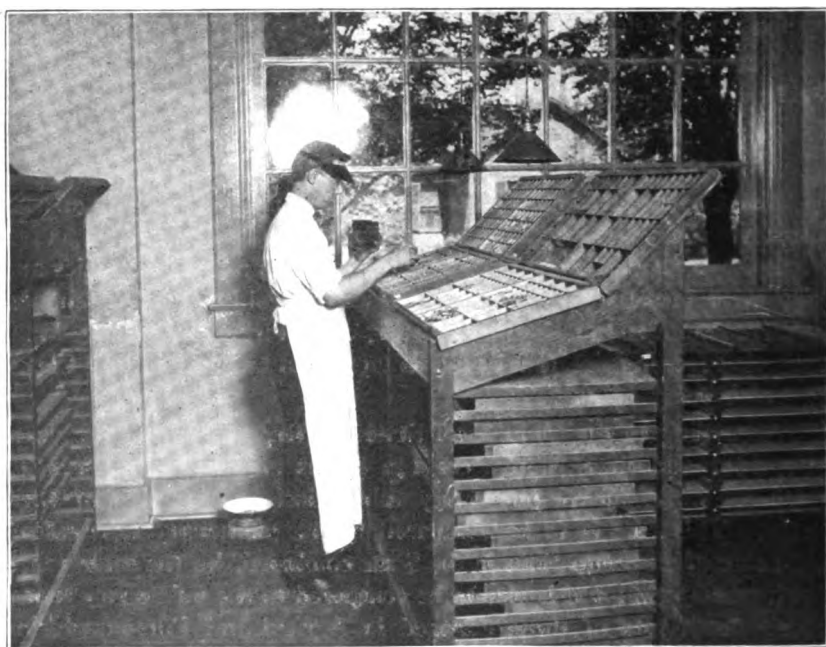


FIG. 48. PROPER ARRANGEMENT OF WORKMAN TO LIGHT.

Note shaded lamps, eyeshield, also convenient cuspidor. Many less skilled workers do just as tedious eyework under exactly opposite conditions.

were considered modern in 18 places, fairly so in 5 and crude in 3. Labor organization existed in 9 places. The attitude toward employes was good in 20, fair in 4, and bad in 2 places. The employes were an intelligent type in 20 places and the majority only fairly so in the remaining 6. Employes were well retained in 21, fairly so in 1 and not so in 4 places. Instructions along health lines in the form of placards were found posted about, in 4 places. In

none of the places were benefit organizations existing (union printers excepted). The workers were all skilled in 13 places, fairly so in 7 more and largely unskilled in the remaining 6. There were a total of 67 employes over 40 years of age, 424 between 20 and 40 and 22 under 20. Work rooms were hygienically constructed in 13 places, fairly so in 4 and bad in 9. Other processes in the job printing room were numerous and found to exist in about $\frac{1}{3}$ of the places.

Dust was a fair hazard in 10 places, bad in 1 and negligible in the remaining. Quarters were kept *clean* in 14, fairly so in 9 and not so in 3. Dry sweeping and dusting of fonts with an air blast are pernicious. *Cold and dampness*, due to inefficient heating, were found to exist in 4 places. *Light* was good in 17 places, fair in 4 and poor in the remaining 5. General room *ventilation* was only fair in 10 places and bad in 7 more. *Fatigue* seemed a negligible factor in 8 places, fair in 10 and bad in the remaining 8, due, principally, to hurrying piece-work, monotony, constant standing, strain, chairs and stools without backs, faulty postures and in some cases jarring processes and loud noises. Eyestrain and myopia are special hazards of the printer and every such worker should be assured of the condition of his eyes for such work. The workday was found to be 8 hours in 13 places, $8\frac{1}{2}$ to 9 in 5 places, and 9 to 10 in 8 places. The noon recess was 1 hour in 3 places, 45 minutes in 7 and $\frac{1}{2}$ hour in 16. Overtime was rarely done. The risk of contracting *communicable diseases* was negligible in 10 places, fair in 6 and considerable in the remaining 10, due, principally, to promiscuous spitting, absence of cuspidors, inadequate washing facilities and closets, common cups and towels and less often to crowding, common handling of objects, and trivial injuries. Adequate medical supervision was universally absent. While the risk of *poisoning* was largely a question of personal hygiene (avoiding dust and holding the type in the mouth), still in $\frac{1}{3}$ of the places certain conditions favored poisoning; such as, lack of instruction, workers' ignorance, inadequate washing places, eating while at work and in the workroom, absence of lockers, dry sweeping, and lack of ventilation for fume-producing processes. The poisons noted were lead, analin oil, benzine, carbon dioxide, fuel gas, type dust (which also contains antimony), bronze powders and paraffin fumes. An industrial inducement to *alcoholism* and stimulants was a fair hazard in 18 places, especially so in 5, due to inadequate drinking water facilities combined with the depressing influences above mentioned.

The general *appearances* of employes were good in 19 places, while in 7 a certain number of pale, sickly and presenile persons were seen. The chief *complaints* of workers were poor room ventilation, fumes, type-dust, risk of lead poisoning, and working along with supposedly tuberculous fellow-workers. One case of lead poisoning was seen, and another case of the same complaint which was tentative. Lead poisoning which occurs in this process is usually of very slow progressive character, producing hardened arteries, enlarged heart and apoplectic strokes. *Comments*.—While 6 plants visited were models in sanitation and ventilation, the majority need attention given to still, "dead" air, especially in which free gas flames are present. Especially, is a vacuum cleaner to be used in type-font rooms. The hazards mentioned above suggest other features to be remedied.

PRINTING. — TYPE MACHINES.

This class of procedure includes all processes in which type metal is melted and used, such as linotyping, monotyping, and stereotyping. (Electrotyping is practically identical with electroplating, *q. v.*) These are here reported upon as the results of our investigation in 15 plants. The total wage-earners so employed was 361, of whom 348 were males and 13 were females. Seven of the places were union shops. The general attitude toward employes was good in 12 places, and at least fair in the remaining. The workers were

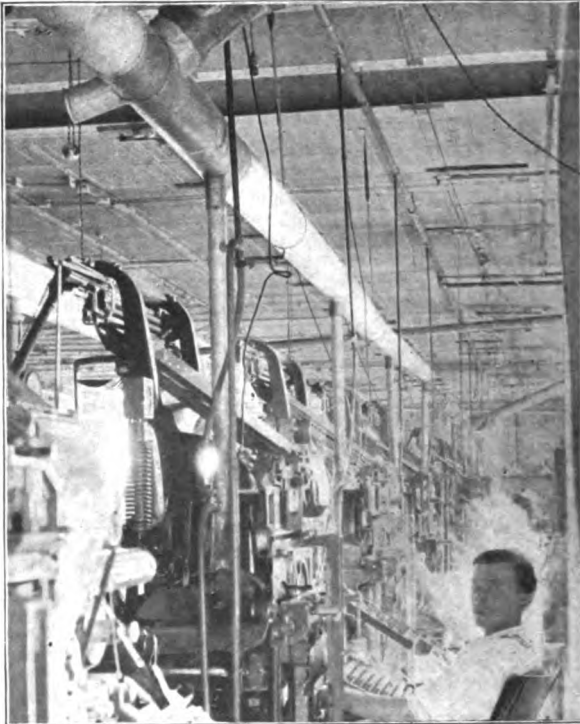


FIG. 49. LINOTYPE ROOM. SHOWING SYSTEM WITH CONNECTIONS TO EACH METAL POT AND BURNER. THE WHOLE SYSTEM IS CONNECTED TO A TALL CHIMNEY STACK. IN ADDITION THE ROOM HAS TWO LARGE EXHAUST FANS TO PROMOTE AIR CIRCULATION.

of intelligent type in all places, except here and there a few non-English speaking laborers. Retention of workers was good in 12 places, fair in 1, and not so in 2. Health appliances, such as hoods and stacks over metal pots, furnaces and burners, were good in 5 places, fair in 2, and absent in the balance. In 3 places there were sick benefit associations. In 12 places the mass of the workers were skilled, and in the remaining, unskilled. There were 52 employes over 40 years of age, 295 between 20 and 40, and 14 under 20. The

workrooms were hygienically constructed in 6 places, fairly so in 4, and not so in 5. In 4 places, other processes were carried on in the same quarters, such as press work, hand type-setting, etc.

Except in electrotyping, *dust* is not a feature of the process, although in several places there was some dust in the air. Dirt and waste *accumulations* were well taken care of in but 2 places, and were not a bad hazard at any place. Inasmuch as lead is in high percentage in the type metal used, greater *cleanliness* should have been the rule in 13 places. *Dampness* is not a feature of the process. *Light* was good in all but 2 places, where it was poor. General room *ventilation* was good in only 1 place (which had all machines piped and exhaust fans in the windows, while in 6 places it was decidedly bad. The chief features were the escape of gases and fumes from the hot processes, absence of air-agitators and means of renewing the air. *Heat* was a negligible

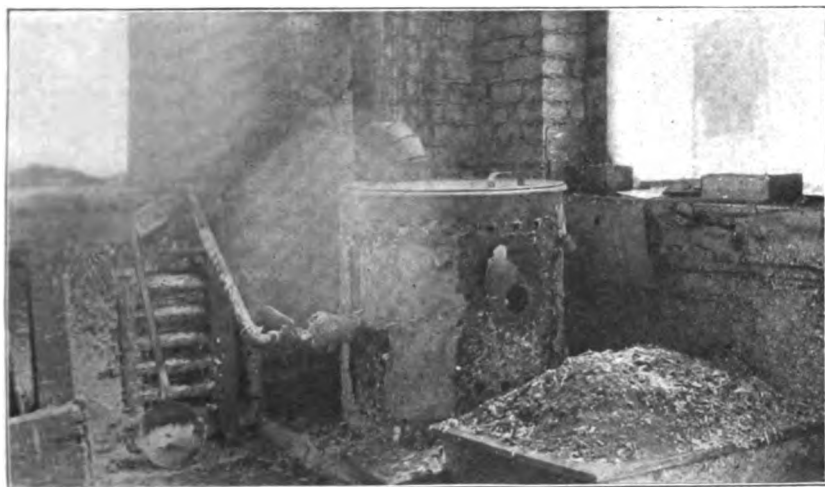


FIG. 50. RECOVERING TYPE METAL.

This melting process should always be done in a separate room.—Type metal pot covered and fairly well flued.

factor in 7 places, a fair hazard in 7, and bad in 1. *Fatigue* was not found to be any particular hazard any place. The work day was 8 hours in 11 places, and from 8½ to 10 hours in the other 4. The noon recess was 1 hour in 4 places, ¾ hour in 5 places, and ½ hour in 6. The risk of contracting *communicable diseases* was negligible in 2 places, fair in 6, and considerable in 7, due, principally, to promiscuous spitting, absence of cuspidors, inadequate wash-places and closets, common towels and cups, occasionally crowding of workers together, with lack of medical supervision. Industrial *poisoning* was quite negligible in 4 places, a fair hazard in 4, and a considerable hazard in 7, due, chiefly to the absence of hoods and vent pipes over metal pots, and especially over gas burners and furnaces; also to absence of proper washing facilities. A chief feature was the habit which some workers had of continually stirring up the surface of the molten metal by dropping in slugs and waste metal at

frequent intervals, thus permitting the fine sub-oxide of lead dust, as well as antimony vapors, to escape. Industrial inducement to *alcoholism* and stimulants was a fair hazard in 10 places, due, principally, to the depressing influences cited above, rather than drinking water facilities.

In 9 places, including most of the larger ones, workers were healthy looking. In 4 the majority were only fairly so, and in 2 quite a number were seen who did not appear well. Their chief *complaints* were the fumes, absence of hoods and poor room ventilation. One case of chronic plumbism was seen, and 1 case of antimony poisoning, causing dermatitis as well as bronchitis. *Comments.*—The better places have melting pots for scrap metals in a room separated from other workers. Also, over the type-metal pot, heating apparatus and gas flame is a hood and stack passing to the exterior. In some places the stack was found to extend only a few feet above the machine, whence its fumes were given off to the air of the room.

PRINTING. — PRESS ROOM WORK.

This process is here reported upon as investigated in 13 plants, all printing and publishing establishments, employing a total of 392, of whom 360 were males, and 32 were females. Four plants were unionized. The general attitude towards employes seemed good in 12, and at least fair in the 1 remaining place. The workers were uniformly of an intelligent type. Retention seemed good in all places. Health appliances, consisting of hoods and flues for drawing off escaping gas fumes in drying freshly printed work were present and efficient in 2 places. A sick benefit association existed in 1 place. The majority of the workers were skilled in 3 places, and largely unskilled in 1 only. There were 35 employes over 40 years of age, 327 between 20 and 40, and 38 under 20. The press-room was hygienically constructed in 7 places, fairly so in 3, and not so in 3. Other processes were usually absent in the press-room.

A slight amount of *dust* was in the air in the majority of places. *Cleanliness* was excellent in 3 and fair in the remaining 10. *Dampness*, because of poor location, was a fair hazard in 4 places. *Light* was good in 8 places, fair in 3, and poor in 2 places. General room *ventilation* was excellent in 2 places, fair to good in 7, and poor in the remaining 4, due to lack of means to keep the air in motion, ingress of city smoke, ink odors, and gas fumes from driers. *Heat* was negligible in 5, fair in 7, and bad in 1 place, due to unflued gas-burners. *Fatigue* was not much of a feature, although constant standing, awkward postures, and a good deal of noise were common. The workday was 8 hours in 9 places, and from 8½ to 10 hours in the remaining 4. Some overtime was the feature of several places, while night work and night shifts, in the case of large dailies, were, of course, the rule. The noon recess was 1 hour in 1 place, ¾ hour in 5, and ½ hour in 7. The risk of contracting *communicable diseases* was negligible in 5, fair in 5, and bad in 3 places, due, chiefly, to promiscuous spitting, absence of cuspidors, inadequate wash-places and closets, and common drinking cups. Industrial *poisoning* was negligible in most places; the chief danger was in cleaning off rolls with compounds rich in anilin oil, to which our attention has been called several times. The workmen concerned were found unconscious with the features very dark colored, and only revived after hours of resuscitating efforts. Free-flame gas burners and benzine fumes were other air-contaminators. Industrial *stimulant-*

ism was more or less incited in half of the places, chiefly because of the depressing influences of poor room ventilation.

In 10 places all workers looked healthy, while in the remaining 3, several appeared to be sickly. No complaints were made by workmen, with the exception of the odors of gas and of inks occasionally. *Comments.*—Outside of the general features above mentioned, the escape of fumes and gases should be prevented by good suction flues at certain points, and precautions used in regard to substances employed in the cleaning of rolls.

PRINTING. — BINDING ROOM PROCESSES.

These were investigated in 6 establishments. The total persons so engaged was 214, of whom 129 were males and 85 were females. There were no labor unions. The workers were of an intelligent class in all places and retention seemed good everywhere. There were no unions in the places investigated. There were no sick benefit associations. The work did not require much skill. There were a total of 20 persons over 40 years of age, 150 between 20 and 40, and 33 below 20. Work rooms were hygienically arranged in 5 places, and not so in 1. Other processes of minor health significance were also carried on in most of the binding rooms visited.

Dust was present enough to constitute a fair hazard in 4 places. One place was poorly lighted. Room ventilation was excellent in 1 place, fair in 3, and bad in 2. Heat was considerable in 1 place, and a fair hazard in 2 others. Inefficient heating with alternating heat and cold exposures were present in 1 place. Fatigue was only a nominal hazard, although heat, work, monotony and constant standing were features in some places. However, the hours were good. The work day was 8 hours in 3 places, $8\frac{1}{2}$ in 1, and 9 in 2. The noon recess was $\frac{1}{2}$ hour in 3 places, $\frac{3}{4}$ hour in 2 places, and 1 hour in 1. The risk of contracting communicable diseases was excellently provided against in 3 places, but fair to bad in the remaining 3, due, principally, to promiscuous spitting, absence of cuspidors, inadequate washing facilities and closets, the use of common towels and cups, the same toilets for both sexes, and the lack of medical supervision. The use of poisons was no factor in the process, although occasionally shellacs dissolved in wood alcohol were reported. The inducement to industrial alcoholism and stimulants constituted only a fair hazard in some of the places, due to the combination of some of the depressing influences above cited.

The general appearances of workers in this process were good in all places, although in 1 place a worker was said to be at home on account of consumption. *Comments.*—This part of the printing business is practically a general factory process with no hazard peculiar to it. The location upon upper floors where city smoke invaded the quarters was a complaint in 3 places, making it necessary to keep windows closed. Fans or air agitators in the rooms would help considerably to invigorate the workers.

An analysis of various processes in a typical bindery showed as follows:

(1) *Forwarding* — which includes case-making, rounding, gluing, pasting, backing, pressing, also folding of sheets, stitching, tipping, gathering, collating, smashing, trimming, lining-up and casing-in.

(2) *Finishing* — which includes such work as gild lining, striping, lettering, stamping, embossing, gold machine work and marbling.

There are also—

(3) *Ruling*—or passing of sheets of paper through ruling machines.

(4) *Cutting*—which is usually done by machines.

Hand binding may take the place of *Forwarding* in small establishments (for instance, job and blank-book work) and includes such processes as strapping, trimming, gluing, pasting, edge-coloring, sawing backs for stitching, shearing and back rolling by small hand machines.

In large establishments, workers may be employed continuously at any one of these processes and as a result some health hazards appear; for instance, in *Forwarding* there is to be noted the presence of unprotected gas flames, piece work, monotony, constant standing, leaning-over postures, jarring processes (on the backer machines) and nauseating odors from glues and pastes; inactivity and eye-strain from the glare for the folders and stitchers, while the "taker-off" girls are required constantly to walk back and forth all day, and may get their hair caught in machinery. The workers who have to watch sheets constantly, which have printed upon them, half-tones and other illustrations, complain a great deal of headache from eye-strain, which is unquestionably due to contrasts and glare.

Finishing. In finishing there is to be noted a presence of unprotected gas flames from the small stoves used, which are going most of the time; confinement in poorly ventilated quarters, and, it is claimed, no breezes are allowed because of the danger of losing goldleaf. Furthermore, some of the work is of arduous character with, occasionally, long hours, piece work, evidences of speeding-up, considerably monotony, constant standing, constant strain and some eye-strain. Frequent trivial injuries and burns may occur. Under the *poison* list there are to be noted the gilds themselves (analysis of a half dozen of these failed to show the presence of lead or arsenic—the compositions being principally copper, zinc, aluminum and gold), egg-albumin, ink, fish glue, oxalic acid for cleaning, acetic acid, shellac dissolved in wood alcohol, book binders varnish, (banana oil) while the "gold balls" used to collect remnants of goldleaf are composed of rubber dissolved in coal oil. In *Marbling* the workers are exposed to hydrochloric, nitric and other mineral acids, turpentine, wood alcohol, dyes, colors and ox-gall. They work with their arms in troughs and may become spattered with any of the ingredients.

In *Cutting*, heavy pressure is required upon foot levers which hold the sheets of paper in position while the knife cuts through. The operation is a standing one and there is considerable danger of injury, either from carelessness or the breaking of the catch which holds the knife.

In *Ruling* there may be eye-strain from the glare of the paper, as well as from contrast of colors. The work is also very monotonous, the feeders, who are usually girls, having to remain seated constantly with no opportunity for exercise. The aniline dyes are used for the colors and occasionally wood alcohol for a solvent.

PRINTING.—ART WORK, HALF TONES, ZINC ETCHING, ETC.

The processes included here are designing, artist's work, aerographing, photo-engraving, etching, vignetting, transfer work (decalcomania), graining, stippling and sketching. These processes were investigated in 6 plants making such work their sole specialties, and employing a total of 157 workers, of

whom 2 were females. Also one electrotype plant had 37 workers (all males) engaged in the process here named. Similar lines of work are also reported under special industries (see Pottery, etc.). The workers were of necessity of good intelligence, yet the attitude toward them in 2 places seemed rather bad. There were no health instructions, placards, or special appliances, although precautions were ordinarily good. There were 32 over 40 years of age, 123 between 20 and 40, and 2 under 20. The construction of work rooms was excellent in 5 places, and bad in 1. Other processes, such as litho-transferring and stone work, were also carried on in the same quarters in 3 places. *Dust, dirt, and dampness*, were fair hazards in 1 place. In 2 places the room *ventilation* was bad and the air pungent with turpentine, electroplating, and various chemical fumes. *Fatigue* was no factor, except that eyestrain might ensue from the arc-lamp reflections in long exposures in the photography branch. *Inactivity* was a hazard, however, to all the sedentary workers (artists, designers, wood and steel engravers). The liability to *communicable diseases* was usually slight, but in 1 place there was promiscuous spitting, the absence of cuspidors, inadequate washing facilities and closets, which, with the use of common towels and dry sweeping, constituted considerable hazard.

Many *poisons* were used in the various sub-processes named. The *artists* were liable to lead, arsenic and chrome poisoning from the habit of tipping the brushes in the lips and especially from the aerographing work. Often their faces were within 8 to 14 inches of their work and in the field of the spray. In some instances one could distinguish the artists from the designers by the pallor on the faces of the former (lead poisoning (?)). The *photographers* handled potassium cyanid in concentrated solutions (both in and out of the dark rooms), also corrosive sublimate, iodine, silver nitrate, copper sulphate, and metol, from all of which they complained of skin eruptions, ulcers, pigmentations and dermatitis. Precautions were usually well observed. Lots of running water was usually depended upon to prevent skin effects. The *photo-engravers* came in contact with benzol in dissolving rubber films, alcohol and ether in collodion films, strong acetic acid in removing films, ammonium dichromate and gas fumes in sensitizing the copper plates, and ferric chloride in etching; also nitric acid fumes from the open rocking trays, as well as fusion products in zinc etching. There were no risks in *routing* and *blocking*, except in the case of electrotypes which are mounted on lead backs. *Vignettiers* used ferric chloride as the etcher which, in bulk form, contained enough free hydrochloric acid to produce some skin irritation if used carelessly. *Proving* is the same as Printing Press Work (*q. v.*) Skin eruptions, nose and throat irritations and bronchitis were the chief complaints.

Comments.—Placards concerning the poisons used, labels on all poisonous materials, and ventilation in small rooms, would do away with all poisoning dangers, providing personal care (also in aerographing) were well observed. The use of rubber gloves is said to be impractical.

Cases of *appreciated poisoning* in the industry are rare as is shown in the Report of the 15th Annual Convention of the International Photo-engravers Union, 1914. Out of 42 locals (about half of the total in the union and probably representing the great majority of the workers) which responded to a request on the part of the officers for information upon "Members incapacitated for work by accidents from machinery, chemicals, gradual poison-

ing, loss of weight, or other disabilities incurred in the pursuit of photo-engraving", 34 locals, reported no cases, while 8 reported as follows:

Bichromate poisoning	5 cases
Cyanide poisoning	1 case
Accidents (routers and blockers)	9 cases
Blood poisoning (laid to zinc in a cut).....	1 case
Gradual loss of eyesight (Finishing).....	1 case
Nervous Breakdown	1 case
<hr/>	
Total	18 cases

On the other hand, that some malignant factor (chronic poisoning ?) is at work among photo-engravers is shown by the enormous death rate from tuberculosis and degenerative diseases: of 23 deaths in the fiscal year ending June 30, 1914, 9 were from tuberculosis, 7 from degenerative diseases, 1 from accidental poisoning, 1 from erysipelas, 1 from intestinal obstruction, and 4 from accidents and injuries. — Furthermore (p. 45, of above mentioned Report), "A review of our records since 1903 discloses the fact that there have been 217 deaths. Out of these 217 deaths, 88 were due to tuberculosis — *very nearly 41 per cent.*" (Italics are ours.)

(This completes the discussion of Printing Processes; next month the subject of Laundering, Dry Cleaning and Dyeing will be taken up.)

A COLLECTION OF APHORISMS ON INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASES SUITABLE FOR EXHIBIT DISPLAYS.

E. R. HAYHURST, M. D.,
Director, Division of Industrial Hygiene.

The following Aphorisms, Maxims and "Digested Thoughts" have been taken from many sources and acknowledgment is hereby made of the same:

1. Are you in business for your health? If not, you ought to be.
2. Work should promote health, not destroy it. We are made to labor.
3. Well-kept working places pay bigger dividends than well-kept hospitals, cemeteries and charities.
4. The White Label of the Consumers' League means that products were made under sanitary working conditions.
5. Do not work in a **DUSTY** atmosphere. If your job calls for that, stop the dust or wear a respirator.

6. Insist upon a **CLEAN** place in which to work. It means health, better morals and greater production.
7. Demand good **LIGHT** where you work—daylight if possible; if not, the best possible substitute.
8. Don't risk your health by working continuously in a **DAMP** place.
9. Remember **GOOD AIR** prevents most occupational diseases. Good air is about 68° in temperature, 60° in relative humidity, and has motion. It is also free from dust, gases, fumes and disease germs.
10. In almost all trades extreme **HEAT** may be kept away from the workmen. See that your employer does this. It is important.
11. **FATIGUE** is the most common cause of disability. Monotonous application is the chief cause of fatigue. Fatigue poisons incite alcoholism, coffeeism, etc. Wise employers seek to vary work processes.
12. If you work at a machine or at a desk, remember that frequent **EXERCISE** is absolutely essential to maintain health.
13. **DISEASES** are spread by overcrowding, common towels, drinking cups and lack of cuspidors. Also by the presence of persons with communicable diseases like consumption.
14. If **POISONS** are used in your work see that none gets into your nose or mouth; and if you are unavoidably affected see a physician at once—while there is yet time.
15. Work in **COMPRESSED AIR**. — No risk when air-lock is used (properly).
16. **STIMULANTS** hasten all occupational diseases.
17. **AIR** is **BAD** when it is —
 1. Stagnant — not circulating,
 2. Too high or too low in moisture,
 3. Wrong in temperature — high,
 4. Contaminated — by dust, smoke,
 5. Chemically changed — by gases, fumes, vapors,
 6. Polluted — by germs, others breaths,
 7. Objectionable in odor — causing nausea, poor appetite.
18. **AIR** is **GOOD** when it —
 1. Circulates,
 2. Has a relative humidity of 50 to 65%.
 3. Has a temperature (indoors) about 68°,
 4. Has no visible floating matter — dust, smoke,

5. Has no noticeable gases, fumes or vapors,
6. Is not polluted — dusting, dry sweeping or crowding,
7. Is pleasant to breathe.
19. The **AIR** in most buildings heated by stoves, furnaces, steam or hot water is **DRIER** than that of **THE SAHARA DESERT**. Hence, sore throats, cold, sickness.
You must moisten air — there are many ways to do so
Watch your **WET-BULB THERMOMETER**.
20. Good **ILLUMINATION** Means —
 1. Steady light — 3 c. p. per square foot on a desk top,
 2. Right direction — not direct or glaringly reflected into eyes,
 3. Free from sharp contrasts with shadows,
 4. Light walls, ceilings and window curtains,
 5. Good eyesight: — Your eyes may need examining.
21. Production depends on material, methods and men. Don't forget the men.
22. The age of master and man has gone, the age of co-operation is here.
23. Labor is the capitalization of mankind.
24. The cost of a business must include the extravagance of human waste.
25. The untimely loss of a tried and experienced workman affects everybody.
26. A community is wealthy in proportion to the number of healthy people it contains.
27. Wealth depends upon production.
Production depends upon efficiency.
Efficiency depends upon health.
28. Let the natural forces have sway — sunlight, air, heat and water.
29. If it is hazardous to human lives to produce an article of human usefulness, then the cost of production should include the cost of the conservation of health.
30. A proper place to work, and safe methods of working, and some knowledge of the danger to health and life are pre-requisites to working or to conducting any business, no matter whether one man or a thousand are concerned.
31. The health of the individual is an affair of the State, since his dependency, wilful or otherwise, becomes a burden upon the State, directly or indirectly.
32. An Occupational Disease is one which is due to dangers (health hazards) in our work.
(U. S. — 1913)

30,000,000 men in gainful occupations,
 8,000,000 women in gainful occupations,
 21,000,000 attending schools,
 59,000,000 persons liable to occupational diseases.

33. These are the primary causes of occupational diseases:

Dust	Temperature
Dirt	Fatigue
Dampness	Inactivity
Darkness	Infections
Devitalized Air	Poisons

34. These are the secondary causes of occupational diseases:

Ignorance	Crude Methods
Indifference	Senseless Haste
Carelessness	Shortsightedness
Avarice	Competition's Ghost

35. Occupational Diseases are prime causes of ill-health in the prime of life; they result in —

Premature old age
 Displacement by younger men
 From tradesman to common laborer
 Discouragement, vagrancy, alcoholism
 Short life
 Helpless families
 Dispensaries, county hospitals, asylums
 Juvenile courts, reformatories.
 Charities, poor houses and pauper fields.

36. Preventable causes are responsible for 250,000 working people's deaths every year. Over half of the deaths of working people are preventable. Three-fourths of the preventable deaths among working people occur under 45 years of age.

37. Occupational Diseases are especially due to —

Slow Poisoning from lead, arsenic, phosphorus, mercury, wood alcohol, benzene, naphtha, certain dyes, zinc fumes, gas, acids, alkalies.
 Infections such as, — hookworm, anthrax, glanders, tuberculosis, sometimes contagious.
 Compressed air (caisson workers).
 Bad air conditions such as, —
 Excessive heat.

Too much dryness.

Too much moisture.

Rebreathing the same air.

38. Secondary Occupational Diseases. In persons between 20 and 60, occupation is a mighty factor in producing:

- | | |
|----------------------------------|-------------------------|
| 1. Nasal catarrh. | 7. Anemia. |
| 2. Bronchitis. | 8. Run-down condition. |
| 3. Tuberculosis. | 9. Hardened arteries. |
| 4. Pneumonia. | 10. Nervous diseases. |
| 5. Bright's Disease. | 11. Skin diseases. |
| 6. Heart disease. | 12. Digestive diseases. |
| 13. Defective sight and hearing. | |

39. Companions of Occupational Diseases:

1. Loss of efficiency.
2. No work.
3. Poverty.
4. Discouragement.
5. Alcoholism.
6. From tradesman to loafer.
7. From good citizen to crank, vagrant or criminal.
8. Finally a burden to self, family and society.

40. Results of Occupational Diseases:

- Poor health.
- Can't stand much.
- Dulled brain.
- Looks older than his age.
- Chronic diseases.
- Death before his time.

41. **ALCOHOLISM** in the workman. Did you ever stop to think this might be due —

- To a Parched Throat, from dust, gases or fumes?
- To Thirst where good drinking water cannot be had?
- To Fatigue from overwork, heat, etc.?
- To Exhaustion, mental or physical?
- To lack of sufficient Exercise?
- To Personal Uncleanliness — no place to wash?
- To unsanitary Conditions which demoralize?
- To Disease most likely due to occupation?

42. "The sane and well-nurtured person is instinctively good, and primarily honest." — Henry Ford.

NEW DEPARTMENT OF PUBLIC HEALTH AND SANITATION ESTABLISHED AT THE OHIO STATE UNIVERSITY.

It has long been recognized that the ultimate solution of the majority of the public health problems in this country rests in the education of the people. The modern local and state health department is now devoting considerable attention to general education work, and departments of public health and sanitation are being established in many of the leading universities in this country. This is only an indication of the trend of public sentiment and the call which the general public is making for instruction along sanitary lines. Recently the Board of Trustees of Ohio State University have authorized the establishment of a Department of Public Health and Sanitation. For quite a number of years instruction has been given in various departments of the University along the lines of hygiene, preventive medicine, water supplies, sewage disposal, etc. However, no well-organized and coordinated work along these lines has been given.

The appointments which the Board of Trustees have made to the Faculty includes members of the present staff of the State Department of Health. With one exception the appointments in the new Department of Public Health and Sanitation bring new men into the faculty of the University. The department as organized is as follows:

- E. F. McCampbell, S. B., Ph. D., M. D.,
Professor of Preventive Medicine, Head of Department.
- Robert G. Patterson, A. B., A. M.,
Assistant Professor of Public Health.
- Emery R. Hayhurst, A. B., A. M., M. D.,
Assistant Professor of Industrial Hygiene.
- William H. Dittoe, Cer. Engr.,
Instructor in Public Health Engineering.
- Frank G. Boudreau, M. D., C. M.,
Instructor of Public Health and Sanitation.
- Lear H. Van Buskirk, B. S., B. Sc. in Chem. Engr.,
Instructor in Public Health Laboratory Methods.

The majority of the courses offered by the department will be given in the Graduate School of the University. These courses have already been approved by the Graduate Council and by the University Faculty, and have also been approved by the Board of Trustees. A description of the courses is as follows:

COURSE IN PUBLIC HEALTH LEADING TO THE DEGREE MASTER OF SCIENCE.

This Course in Public Health is offered under the administration of the Graduate School of the Ohio State University with the co-operation of the Ohio State Board of Health.

General Information. The principal object of this course is to prepare young men and women for public health work in Ohio and elsewhere, and to fit them to occupy administrative and executive positions as health officers or members of boards of health or secretaries, agents, or inspectors of health organizations. It is planned to provide the scientific ground work of sanitary knowledge which underlies efficient health administration. Exceptional opportunities for the practical study of the art of public sanitation are offered to students in connection with the work of the Ohio State Board of Health, the Board of Health of the City of Columbus, the various village and township boards of health in the vicinity of Columbus, and the various local voluntary organizations engaged in some special field of public health work.

Admission. Graduates in Medicine of Ohio State University and other recognized medical schools will be admitted to the course upon their records and registered as candidates for the degree of Master of Science in Public Health.

Bachelors of Arts, or those possessing equivalent degrees, from Ohio State University and other recognized institutions will likewise be admitted and registered as candidates for the degree of Master of Science (in public health), provided one year's preliminary training has been taken in their collegiate courses in each of the following subjects: Chemistry, physics, zoology, comparative anatomy, physiology and pathogenic bacteriology.

Special students, not candidates for the degree of Master of Science in Public Health, who desire to fit themselves for some special field will be admitted to the course on approval of the Graduate Council.

COURSE OF STUDY.

<i>First Semester.</i>		<i>Second Semester.</i>	
Hygiene (101).....	2	Preventive Medicine (104).....	2
Public Health Administration and Public Health Problems (105)...	2	Hygiene—Special (102).....	2
Demography (107).....	2	Social Service and Public Health Nursing (108).....	2
Communicable Diseases (109).....	3	Communicable Diseases (110).....	3
Public Health Engineering (111)...	4	Public Health Engineering (112)...	4
Public Health Laboratory and In- spection Methods (113).....	3	Seminar and Thesis (116).....	1
		Public Health Laboratory and In- spection Methods (114).....	3

The other requirements for this degree, namely, *Residence Requirement, Date of Admission to Candidacy, Examination and Thesis* shall be the same as the corresponding requirements for the degrees of Master of Arts and Master of Science.

Courses in Public Health.

(101) Hygiene.

Two credit hours per week. First Semester.

Exercise, fatigue, rest, bathing, clothing, diet, operation and care of the human mechanism.

(102) Hygiene—Special.

Two credit hours per week. Second semester.

Industrial hygiene, including occupational accidents, industrial poisonings, health hazards in connection with various industries. Inspection trips.

Mental hygiene, prophylaxis, relation of acute infectious diseases, alcoholism, mental tests. Inspection trips.

(104) Preventive Medicine.

Two credit hours per week. Second semester.

General course to give a broad view of the important facts and principles in preventive medicine and the sociological aspects and methods of public health.

Special problems, venereal prophylaxis, ocular hygiene, oral prophylaxis, diseases of the ear and nose.

(105) Public Health Administration and Public Health Problems.

Two credit hours per week. First semester.

Efficiency of public health measures, organization of national, state and local health departments, sanitary law and legal powers and responsibilities of health officers. Current problems in hygiene and sanitation.

(107) Vital and Sanitary Statistics.

Two credit hours per week. First semester.

Vital, social and sanitary statistics.

(108) Social Service and Public Health Nursing.

Two credit hours per week. Second semester.

Preventable diseases discussed from their social aspects. Relation between social science and preventive medicine. Existing agencies and principles involved in dealing with medico-sociological problems.

History of nursing, organization and principles underlying public health nursing, with particular reference to Ohio.

(109-110) Communicable Diseases.

Three credit hours per week. The year.

Clinical study and administrative control of the more common communicable diseases. Visits to the hospitals and laboratories.

(111-112) Public Health Engineering.

Four credit hours per week. The year.

Principles of sanitary engineering and municipal sanitation. Public water supplies and water purification, pollution of streams, methods of sewage and garbage disposal, street cleaning, hygienic housing, plumbing, ventilation and the effect of insanitary conditions on the public health. Inspection trips.

(113-114) Public Health Laboratory and Inspection Methods.

Three credit hours per week. The year.

Methods and examinations employed in diagnosis of communicable diseases, water, food and drug analyses and inspection of meat, milk and food products.

(116) Seminar and Thesis.

One credit hour per week. Second semester.

Public sanitation problems.

It is planned also, to open these courses for election by advanced under-graduate students. Courses in preventive medicine will also be given in the senior year in the medical college. The time schedule of the above mentioned course leading to the degree of Master of Science is as follows:

Subject:	No.	Hrs.	Hours of Attendance.					
			M.	T.	W.	Th.	F.	S.
Public Health	101	2	.....	9	.....	9	.....	.....
Public Health	105	2	.....	8	.....	8	.....	.....
Public Health	107	2	.....	10	.....	10	.....	.....
Public Health	109	3	9	.....	9	.....	9	.....
Public Health	111	4	11	11	11	.....	11	.....
Public Health	113	3	.....	2-5	.....	2-5	.....	.....
Public Health	102	2	.....	9	.....	9	.....	.....
Public Health	104	2	.....	8	.....	8	.....	.....
Public Health	108	2	.....	10	.....	10	.....	.....
Public Health	110	3	9	.....	9	.....	9	.....
Public Health	112	4	11	11	11	.....	1-4	.....
Public Health	116	1	3-5	.....	.....	.....	.....	.....
Public Health	114	3	.....	2-5	.....	2-5	.....	.....

Already a large number of inquiries is being made by those interested in the field of public health. The ordinary University requirements as to fees, etc., will obtain. The University will open on September 21st and all those interested in entering the course should correspond with the Registrar of the University before this date.

FORTY-SECOND CONFERENCE OF HEALTH OFFICERS.

The 42nd Conference of the Ohio State Board of Health with representatives of local boards of health was held at Cedar Point July 13th and 14th, 1915. Following is the program of the Conference.

PROGRAM.**FIRST SESSION**

JULY 13, 2 P. M.

1. Chairman's Address — Improvement in Health Conditions in Ohio.
H. T. Sutton, M. D., F. A. C. S., President State Board of Health.
2. Water Supplies in Villages and Rural Districts.
W. H. Dittoe, Director, Division of Sanitary Engineering. Discussion.
3. Public Health Nursing Service.
R. G. Paterson, Ph. D., Director Division Public Health Education and Tuberculosis.
Discussion.
4. The Sanitary Survey; What it is.
L. H. Van Buskirk, Assistant Engineer and Acting Director, Division of Laboratories.

SECOND SESSION

JULY 13, 8:00 P. M.

1. The Symptoms, Diagnosis and Prevention of Rabies.
E. F. McSherry, M. D., Assistant Bacteriologist, Division of Laboratories.
Discussion.
2. The Responsibility of the Health Officer in Controlling Epidemics.
W. E. Obetz, M. D., Assistant Epidemiologist.
Discussion.
3. The Collection and Value of Morbidity Statistics.
George B. L. Arner, Ph. D., Statistician, Division of Communicable Diseases.
Discussion.

THIRD SESSION

JULY 14, 8:30 A. M.

Health Officers' Round Table.

Conducted by James E. Bauman, Assistant Secretary, and Frank G. Boudreau, M. D., Director, Division of Communicable Diseases.

Questions.

1. How are boards of health appointed in cities, villages and townships?
What is their authority and jurisdiction?
2. Who should be appointed as health officer? What are his duties and how is he compensated?

3. What should be included in the sanitary code of a village or township; how adopted and enforced?
4. Who pays the expense of quarantine and disinfection?
5. What is the procedure to be followed in the abatement of a nuisance?
6. How are the expenses of the board of health to be met?

Mr. Bauman.

1. What are are reportable diseases in Ohio and how should they be reported?
2. What diseases are quarantinable in Ohio and how should they be quarantined?
3. What should the health officer do when typhoid fever is reported or suspected?
4. What should be done when a milk-borne disease is reported in the family of a dairyman?
5. When should schools be closed for communicable disease?
6. When and how to disinfect and its relation to the termination of quarantine.

Dr. Boudreau.

Questions proposed by delegates.

Adjournment.

This conference was for the boards of health and health officers of all villages of less than 3,000 population and all the townships in the following counties:

Allen	Fulton	Lorain	Sandusky
Ashland	Geauga	Lucas	Seneca
Ashtabula	Hancock	Mahoning	Stark
Auglaize	Hardin	Marion	Summit
Carroll	Harrison	Medina	Trumbull
Columbiana	Henry	Morrow	Tuscarawas
Coshocton	Holmes	Ottawa	Van Wert
Crawford	Huron	Paulding	Wayne
Cuyahoga	Jefferson	Portage	Williams
Defiance	Knox	Putnam	Wood
Delaware	Lake	Richland	Wyandot
Erie			

These conferences are provided for in the following sections of the General Code:

Section 1245. The state board of health may make provision for annual conferences of health officers and representatives of local boards of health for the consideration of the cause and prevention of dangerous communicable diseases and other measures to protect and improve the public health. Each board of health or other body or person appointed or acting in the place of a board of health shall appoint a delegate to such annual conferences. The city, village or township shall pay the necessary expenses of such delegate upon the presen-

tation of a certificate from the secretary of the state board that the delegate attended the sessions of such conference.

Section 1246. The state board of health may provide for one annual conference of representatives of city boards of health, another for representatives of village boards of health and one or more for representatives of township boards of health or make such other division of conferences as it deems best. No conference shall continue in session longer than three consecutive days, and no board of health shall be required or authorized to send a delegate to more than one conference in any year.

There were in attendance at this conference about 350 representatives of the local boards of health in Northern Ohio. It is to be regretted that all boards of health in this section of the state did not avail themselves of the opportunity to send representatives to the conference as the sole purpose of the conference is to provide a school of instruction for health officials. The program is made up of papers on topics of everyday interest to a health official and a full discussion of each topic is invited.

In addition to a program of papers on subjects relating to public health, one session of this conference was devoted to a round table discussion of questions presented by health officers. For several months past in connection with the State Public Health Exhibit, which has appeared in most of the counties of the state, meetings have been held of the health officials of the county where the exhibit was appearing. These meetings have been of great value to health officials and to the representatives of the State Board of Health who attended the meetings. The questions discussed at this conference were taken from lists of questions presented at meetings of county health officials. It is hoped that the health officers' round table at the recent conference was of benefit to all of the delegates who were present.

The papers presented will be published in full in succeeding numbers of the Ohio Public Health Journal.

Following is the official list of those in attendance:

ALLEN COUNTY

Beaverdam	Allen Phillips.
Bluffton	Dr. J. Steiner.
Elida	Abner Brennemen.
German Tp.....	Dr. Charles Smith, N. E. Breneman.
Richland Tp.....	J. C. Snider, S. W. Steiner.
Sugar Creek Tp.....	Wm. Ridenour.
Milton Tp.....	Clem Hassinger, M. E. Hoover.

ASHTABULA COUNTY

Geneva	C. D. Adams.
Jefferson	W. S. Andrews.
Ashtabula Tp.....	Julius Williams, G. M. Cox.
Colebrook Tp.....	Dr. H. J. Shatto.
Dorset Tp.....	C. B. Kennedy, W. D. Burgett.
Harpersfield Tp.....	E. H. Rawson.
Jefferson Tp.....	A. G. Giddings.
Lenox Tp.....	L. V. Bennett.
Plymouth	A. M. Misner.
Saybrook Tp.....	W. K. Wilkinson.
Plymouth Tp.....	L. M. Harper.
Williamsfield	L. L. Phelps.
Windsor Tp.....	Fred Beckwith.

AUGLAIZE COUNTY

Unipolis	Andrew J. Blank.
Duchonquit Tp.....	Joe F. Fisher.
Goshen Tp.....	J. T. Bogart.
St. Marys Tp.....	Dr. W. A. Deerhake.
Union Tp.....	George L. Bowman.
Wayne Tp.....	Dr. J. M. Day.

CARROLL COUNTY

Augusta Tp.....	A. H. Meyers.
Brown Tp.....	J. N. Robertson.

COLUMBIANA COUNTY

Leetonia	J. R. Stratton.
Franklin Tp.....	J. A. McCord, W. L. Smith.
Knox Tp.....	Dr. P. Stouffer.
Salem Tp.....	Frank L. Stouffer.
Unity Tp.	E. L. Early.
Washington Tp.....	J. W. MacGillivray.

COSHOCTON COUNTY

Clark Tp.....	Dr. Homer B. VanHyning.
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CRAWFORD COUNTY

Auburn Tp.....	Dr. George O. Blair.
Dallas Tp.....	Dr. C. L. Baker.
Holmes Tp.....	Dr. C. R. Sheckler, J. A. Leimenstoll.
Lykens Tp.....	F. G. Bowers.
Polk Tp.....	Henry Monat.

CUYAHOGA COUNTY

Berea	Dr. J. G. Noland.
Brook Park	Dr. John G. Noland.
Cleveland Heights.....	Dr. Emil H. Stone.
Dover Village	L. A. Williams.
East View.....	George G. Schwerzler.
Linndale	J. W. Hazel.
Newburgh Heights.....	F. E. Farrar, G. W. Vocke, J. W. Ham- mersley.
Rocky River.....	Jacob Burkemer.
Bedford Tp.....	E. J. Caskey.
Mayfield	A. J. Brainard.
Middleburgh Tp.....	C. F. Eickert.
Strongsville Tp.....	Dr. J. B. McConnell.

DEFIANCE COUNTY

Sherwood	Dr. H. C. Lindersmith.
Delaware Tp.....	George English.
Milford Tp.....	T. F. Carey.
Tiffin Tp.....	E. N. King.

DELAWARE COUNTY

Ashley	Dr. C. A. Day.
Ostrander	C. R. Bell.
Berlin Tp.....	W. W. Shank.
Delaware Tp.....	Dr. O. W. Bouner.
Oxford Tp.....	T. W. Lea.
Scioto Tp.....	W. R. Andrews.

ERIE COUNTY

Berlin Heights.....	Dr. G. W. Hine.
Huron	Robert Day.
Berlin Tp.....	T. M. Elson.
Huron Tp.....	Robert Day.
Margaretta Tp.....	Dr. Wm. Story.
Oxford Tp.....	Dr. M. J. Love.

FULTON COUNTY

Delta	A. B. Thompson.
Fayette	G. B. Caulkins.
Fulton Tp.....	H. E. Brailey.
Pike Tp.....	M. L. Sindel.
Swan Creek Tp.....	A. L. Donahue.
Wauseon	Robert Sweeney.
York Tp.....	F. E. Tervilliger.

GEAUGA COUNTY

Middlefield	Dr. F. S. Clapp.
Huntsburg Tp.....	A. D. Williams.
Middlefield Tp.....	Chas. Wilkinson, A. H. Adams.
Newbury	D. G. Nearpass.

HANCOCK COUNTY.

Mt. Cory.....	Dr. C. F. King.
Rawson	Mike Smith.
Allen Tp.....	William Bowersox.
Cass Tp.....	G. R. Lewis.
Jackson Tp.....	Frank Edie.
Liberty	W. L. Schoonover.
Orange Tp.....	John Caris.

HARDIN COUNTY

Alger	S. Newland.
Cessna Tp.....	John Highslip.
McDonald Tp.....	T. C. Dodds.
Pleasant Tp.....	J. B. Davis, J. P. Siemon.
Washington Tp.....	S. M. Weber.

HARRISON COUNTY

Bowerston	C. D. Rayer.
Cadiz	Dr. W. H. Lemmon.
Jewett	Dr. W. L. England.
Athens Tp.....	J. T. McGrew.
German Tp.....	W. S. Spencer.
Green Tp.....	J. G. Dixon.

HENRY COUNTY

Liberty Center.....	Henry Stout.
Napoleon Tp.....	George A. Beck.
Bartlow Tp.....	Fred Gribbell.
Marion Tp.....	F. M. Smith.
Pleasant	A. H. Kinstle.
Pleasant Tp.....	Dr. W. S. Hilton.

HOLMES COUNTY

Millersburg	J. P. Mast.
Knox Tp.....	L. B. Parsons.

HURON COUNTY

New London	W. H. Whitney.
Mansfield Tp.....	F. H. Rumsey.
Norwalk Tp.....	C. W. Drake.
Ridgefield Tp.....	Henry Miller.

JEFFERSON COUNTY

Steubenville Frank S. King.

KNOX COUNTY

Brown Tp..... Dr. J. A. Reed.
 College Tp..... H. W. Jacobs.
 Gambier Frank Dial.
 Jefferson Tp..... Dr. J. A. Reed.
 Middleburg Tp..... Fred Amos, J. H. Leamings.
 Miller Tp..... Dr. Joseph Wagner.
 Pleasant Tp..... Clinton Frye.
 Wayne John Brown.

LAKE COUNTY

Mentor Dr. J. W. Lowe.
 Willoughby Benj. Mosley.
 Mentor Tp..... J. W. Lowe.
 Richmond John J. Purtill.
 Willoughby Tp..... James Moloney.

LORAIN COUNTY

Amherst Dr. W. H. Turner.
 Wellington Grove Howk.
 Avon Tp..... John R. Pipes, L. Heckel.
 Avon Lake Tp..... Fred Engel.
 Black River Tp..... C. R. Horn.
 Columbia Tp..... J. M. Longbon.
 Eaton Tp..... D. A. Burke.
 Elyria Tp..... Dr. J. F. Grabill.
 Grafton Tp..... Charles Schwarz.
 Rochester D. C. Mann.
 Russia Tp..... R. T. Paden.
 Sheffield Tp..... Dr. W. S. Baldwin, D. A. Cook.

LUCAS COUNTY

Sylvania A. D. Lewis.
 Maumee E. F. Wechtel
 Adams Tp..... Herman W. Wintesfeld.
 Sylvania Tp..... A. E. Stow.
 Swanton Tp..... M. G. Will.

MAHONING COUNTY

Canfield Delmore Kirk.
 Austintown Tp..... Dr. J. H. Schnurrenberger.
 Coitsville Tp..... J. G. Perkins.
 Green Tp..... P. H. Leimbauch.
 Milton Tp..... Dr. W. T. Gudgel.

MARION COUNTY

Kirkpatrick	Dr. C. L. Baker.
La Rue	G. B. Henderson.
Prospect	C. M. C. Thomas.
Waldo	Dr. B. D. Osborn.
Marion Tp.....	J. W. Ulsh.
Grand Prairie Tp.....	J. W. Jolley.
Montgomery Tp.....	W. H. Mauller.
Morrall	Jasper W. Jolley, M. D.
Prospect Tp.....	Dr. M. M. Dix.
Salt Rock Tp.....	Dr. J. W. Jolley.
Waldo Tp.....	Dr. O. J. Marsh.

MEDINA COUNTY

LeRoy	H. Rice.
Chatham Tp.....	L. S. Rogers.
Guilford Tp.....	B. H. Kern.
Montville	Winthrop Hill.
Sharon Tp.....	J. A. Stonebrook.
Westfield	J. M. Reich.

MORROW COUNTY

Mt. Gilead.....	Dr. George H. Pugh, H. O.
Canaan Tp.....	Jay Albright.
Cardington Tp.....	E. H. Conaway.
Franklin Tp.....	Walter E. Zohnan.
Gilead Tp.....	Carl Morris.
Perry Tp.....	D. P. Keyes.
Westfield Tp.	Homer Kyrk.

OTTAWA COUNTY

Genoa	George Wright.
Rocky Ridge	Sylvester McNutt.
Danbury Tp.....	Dr. R. L. Waters.

PAULDING COUNTY

Antwerp	James Sexton.
Payne	George W. Howard.
Auglaize Tp.....	George M. Breckler.
Blue Creek Tp.....	Charles W. McGinnis.
Brown Tp.....	G. H. Whiting.
Carryall Tp.....	Charles W. Boland.
Latty	Willard Wilson.
Paulding Tp.....	Dr. L. R. Fast.
Washington Tp.....	Dr. Ernest Kohn.

PORTAGE COUNTY

Hiram	B. L. Dean.
Windham	Dr. J. W. Shank.
Aurora Tp.....	I. H. Stevens.
Charlestown Tp.....	R. A. Sanford.
Ravenna Tp.....	O. G. Harmon.
Rootstown Tp.....	E. E. Lumley.

PUTNAM COUNTY

Columbus Grove.....	Dr. J. N. Heischman.
Jackson Tp.....	Henry Biedenharn.
Perry Tp.....	W. T. Etter.
Pleasant Tp.....	Dr. J. N. Heischman.

RICHLAND COUNTY

Lexington	Dr. J. P. Stober.
Plymouth	C. C. Hills.
Blooming Grove Tp.....	B. B. Crevling.
Blooming Grove Tp.....	Edd McCormic.
Sandusky Tp.....	Johnson Taylor.
Sharon Tp.....	J. W. Hutt.
Springfield Tp.....	C. B. Fox.
Troy Tp.....	Dr. J. P. Stober.
Weller Tp.....	S. C. Lavender.

SANDUSKY COUNTY

Burgoon	J. J. Huber.
Ballville Tp.....	William Keller.
Green Creek Tp.....	A. H. Wicks.
Riley Tp.....	Earl Balsizer.
Sandusky	Lewis F. Werth.

SENECA COUNTY

Bloomville	Dr. H. H. Brundage.
New Riegel.....	Anthony Brickner.
Clinton Tp.....	D. S. Hamilton.
Hopewell Tp.....	C. M. Snyder, John Kissaberth.
Jackson Tp.....	J. S. Good, W. H. Rinebold.
Liberty Tp.....	Dr. M. E. Wilson, George Lynch
London Tp.....	M. B. Stout.
Loudon	John Rainey.
Reed Tp.....	F. B. Shank.
Venice Tp.....	W. A. Jordan, S. F. Reichert.

STARK COUNTY

Minerva	S. E. Morehead.
New Berlin.....	Adam Willaman.
Canton Tp.....	J. Shane.
Jackson Tp.....	Wm. Halter, G. A. Daily.
Lake Tp.....	James A. Nidy.
Lawrence Tp.....	D. K. Jones, M. D.
Lexington Tp.....	Eli T. Shreve.
Nimishillen Tp.....	Dr. C. A. Ruffin.
Paris Tp.....	J. B. Curry.
Perry	L. L. Reese, D. Bischoff.
Pike Tp.....	E. S. Hines.
Plain Tp.....	A. A. Reemsnyder, J. W. Wise.
Sandy Tp.....	Wm. Boorg.
Waynesburg	William Waggoner.

SUMMIT COUNTY

Hudson	Dr. H. C. Coolman.
Kenmore	B. W. Swigart.
Copley Tp.....	Dr. P. B. Long.
Ghent	F. Pierson.
Green Tp.....	F. W. Koontz, Dr. E. C. Hinman.
Hudson Tp.....	Dr. H. C. Coolman.
Northampton Tp.....	John Spiellman.
Northfield	C. S. Machwart.
Norton Tp.....	W. A. Mansfield, M. D.
Portage Tp.....	A. A. Hoffman.
Springfield Tp.....	Emerson Boyer.
Stowe Tp.....	P. A. Bixler.
Twinsburg Tp.....	S. H. Crankshaw.

TRUMBULL COUNTY

Cortland	L. Hutton.
Cortland Tp.....	G. E. Moran.
Howland Tp.....	A. W. Hake.
Johnston Tp.....	A. M. Johnson.
Mesopotamia	Dr. D. S. Lillibridge.
Southington	S. V. Kennedy.
Vienna Tp.....	J. R. Munson.

TUSCARAWAS COUNTY

Mineral Ridge	Edward J. Blunt.
Fairfield Tp.....	Anthony Brown.
Franklin Tp.....	William Myers.
Goshen Tp.....	Chas. Williams, Jacob W. Syron.
Mill Tp.....	N. F. Sproul.
Sandy Tp.....	Dr. C. H. Sawyer.

VAN WERT COUNTY

Scott	U. G. Replogle.
Tully Tp.....	John E. Sowers.
Union Tp.....	Hiram High.
Van Wert.....	E. F. Runyan.
Wayne Tp.....	E. V. Berry.

WAYNE COUNTY

Creston	R. M. Ewing.
Dalton	E. F. Scott.
Smithville	D. D. Hartzler.
Canaan Tp.....	J. W. Oller.
Clinton Tp.....	C. S. Fouch.
Plain Tp.....	Dr. T. A. Weaver.
Sugar Creek.....	A. H. Arick, Clayton Lee Arnold.

WILLIAMS COUNTY

Bryan	R. M. Rice, H. O.
Montpelier	J. V. Lesnet.
Stryker	A. G. Goll.
West Unity.....	Samuel Ozmun.
Brady Tp.....	Horace L. Prouty, M. D.
Madison Tp.....	O. A. Kanauer.
Springfield Tp.....	Fred Allison.

WOOD COUNTY

Bradner	Harry Entsminger.
Haskins	Dr. E. Wilson.
Pemberville	Henry Titkemeier, Aug. Stein.
Freeport	H. E. West.
Tontogany	G. B. Phillips.
Walbridge	C. Metzger.
Grand Rapids.....	Dr. D. R. Barr.
Henry Tp.....	Marion Snyder, Wm. B. Henning.
Perrysburg Tp.....	T. H. Tinney, S. T. Phillips.
Plain Tp.....	J. F. Reed.
Ross Tp.....	Sam Doren.
Troy Tp.....	Frank L. Swartz, George W. Brown.
Washington Tp.....	Wm. Jimison.

WYANDOT COUNTY

Carey	Charles Dame.
Marseilles Tp. and Village.....	A. A. Mackintosh, M. D.
Nevada	H. E. Durri.
Crawford Tp.....	James Weeks.
Pitt Tp.....	C. W. Faucht.

JULY MEETING OF THE STATE BOARD OF HEALTH.

The regular monthly meeting of the State Board of Health was held July 12, 1915, at Cedar Point, Ohio.

Representatives appeared from the city of Akron in response to citation from the State Board of Health to answer to a complaint that the city was responsible for a nuisance caused by the pollution of a ditch with sewage and other wastes. A report of an investigation by a representative of the State Board of Health was presented; from which the Board found that there was good cause for the complaint. The representatives of the city of Akron discussed the complaint and findings with the Board and also discussed the methods by which the condition could be improved. In executive session, the Board, after giving consideration to all the information available and the statements made by representatives of the city, adopted the following order:

"Be it ordered by the State Board of Health of the State of Ohio, that the city of Akron shall within four years from the date of approval of this order by the Governor and the Attorney-General of Ohio install a new sewage treatment plant, or sewers or equipment for conveying or pumping sewage to the general sewerage system of the city, to correct the pollution of the County Infirmary Lateral Ditch as set forth in a petition, under Section 1249 of the General Code, of the trustees of Portage Township, Summit County, May 3, 1915, and as found and determined by the State Board of Health, provided, however, that the city shall within six months from the date of approval of this order by the Governor and the Attorney-General of Ohio, repair, improve, enlarge and provide for the proper operation of the existing sewage treatment plant, to prevent the pollution of the County Infirmary Lateral Ditch pending the installation of permanent improvements for the satisfactory disposal of the sewage."

This order and the record relating thereto has been sent to the Governor and Attorney-General for approval.

At the request of the owners of Ottawa Hills, near Toledo, action was taken by the Board to approve general plans for sewerage and sewage treatment works for that place. Detail plans will be submitted for approval as soon as prepared.

The minutes of the June meeting and the monthly and financial reports of the Secretary were approved. The Board also approved the provisional appointments of J. S. McCune, B. Ph., as chemist,

and of Orson W. Buck, M. E., and Charles R. Parkinson, M. A., as assistant chemists.

Plans for sewerage and sewage disposal for the Dixon Township Centralized School in Preble County and for a centralized school in Tully Township, Marion County, were approved. At the Tully Township school, the Board reserves the right to require secondary treatment of the sewage if it is demonstrated that the leaching cesspool will not prove a satisfactory means of disposing of the sewage.

At the request of council of the city of Cambridge, the Board amended an order adopted June 26, 1913, requiring the installation of a new water supply. The order required the installation of this supply by January 1, 1915. The amendment provides for an extension of eighteen months from the date on which the action of the Board is approved by the Governor and Attorney-General. The Board also acted upon a request from the city of Cambridge for a revision of a condition of the approval for plans for a water supply improvement for that city. This revision provides for an extension of time within which contracts for the installation of the work shall be let.

Plans were approved for a proposed improved water supply and water purification plant for the city of East Liverpool with conditions governing the character of filtering material, devices for the measurement of the raw water and the installation of duplicate gate valves to insure watertightness. The city is also required to employ a competent analyst, experienced in water purification, to superintend the operation of the plant and to furnish daily records of operation. The city is also advised that covers should be provided for the distributing reservoirs so as to prevent deterioration of the stored filtered water.

Plans were approved for a proposed water supply for the village of Mt. Blanchard in Hancock County. The village council is required to pass an ordinance prohibiting the establishment or maintenance of any leaching cesspool or privy or other possible source of contamination within 500 feet of the public water supply well.

The Board approved the plans and specifications for a proposed water purification plant for Napoleon with conditions covering the approval of filtering material, the employment of a competent operator for the water purification plant, and the installation of devices to insure the proper operation of the plant. The village officials were advised that the Board is satisfied that a plant installed in accordance with these plans and specifications will produce a water of satisfactory quality but that it is necessary to provide proper superintendence and analytical control of the operation of the plant to insure its efficiency.

Plans for a proposed water supply for the village of Shadyside were approved contingent upon a test of the wells to insure a sufficient quantity of water and to insure that the quality of the water will be satisfactory. In order to guard against contamination, the village council is required to pass an ordinance prohibiting the establishment or maintenance of any leaching privy vault or cesspool or other possible source of contamination within 500 feet of the public supply wells.

Plans submitted by the city of Zanesville for a proposed water supply to be obtained from drilled wells on the Hague Farm, situated on the east side of the Muskingum River and immediately north of the city, were approved. The Board has required that a thorough pumping test shall be conducted on the proposed wells to demonstrate the quantity and quality of water available and that the hygienic quality of the water as shown by such tests shall be satisfactory to the State Board of Health. It is also required that the city council shall pass an ordinance preventing the contamination of the water by privy vaults, cesspools, or other sources of pollution.

The existing intake line for conveying water from the Muskingum River is to be abandoned as soon as the permanency of the proposed new water supply shall be established and within one year following the installation of the new supply. The city officials are required to provide immediately a satisfactory gate valve to prevent the entrance of river water through the intake line and to see that this intake line is not used after the proposed new supply is made available unless in case of emergency in which event the health officer of the city must be notified, in advance, of the intended action. Attention is called to the fact that although the analysis of water from these wells shows the water to be of satisfactory hygienic quality, it also shows that the water is objectionable because of its mineral constituents.

In order to provide against danger from floods either through the destruction of the wells or contamination of the supply, it is required that proper embankments be provided for the well housings and for the collecting reservoirs.

Plans for the proposed improvement of the sewage treatment plants at the farm of the Cincinnati Fresh Air and Convalescent Aid Society near Terrace Park and the Cincinnati Girls' Refuge Farm, in Hamilton County, were approved with conditions which are deemed essential to the proper operation and efficiency of the plant. In the case of the Cincinnati Girls' Refuge Farm, the Board calls attention to the fact that the sewage treatment plant is located in rather close

proximity to the buildings of the institution and that it recognizes the difficulties encountered in securing additional land. In this regard attention is called to the necessity for providing for the proper operation and the maintenance of the plant to avoid the production of odors which will be detrimental to the comfort of persons at the institution.

At the request of the council of the city of Lakewood the Board amended an order adopted October 15, 1913, giving additional time for the completion of sewage treatment works for that city. The action of the Board in granting this extension of time has been submitted to the Governor and Attorney-General with a request for their approval. The Board approved general plans for proposed sewerage improvements and a sewage treatment plant for this city and urged upon the city officials the importance of making a complete survey of the present sewerage system in order to provide accurate data in regard to sanitary and storm water sewers.

The Board approved plans for proposed sanitary and storm water sewerage for the village of New Boston, with the requirement that the council pass and enforce an ordinance defining the proper use of sanitary and storm water sewers, regulating the establishment of sewer connections and the proper supervision and maintenance of the sewerage system.

Revised plans for an intercepting sewer and sewage treatment plant for the city of Sandusky were approved upon condition that council pass an ordinance regulating the proper use of sanitary and storm water sewers and that competent superintendence be provided to insure the proper operation and maintenance of the intercepting sewer system and sewage treatment plant.

The Board disapproved plans for proposed additional sewerage for the village of Wauseon because of complaints that the stream, which now receives the sewage from that village, is a source of nuisance to those living in the vicinity of the creek and to ditches tributary thereto.

In consideration of conditions at Wauseon, the Board took up the complaints made in 1911 that Turkey Foot Creek is polluted by sewage from the village of Wauseon and received a report of a recent investigation made by the Division of Sanitary Engineering which report shows that the complaints are well-founded and that the creek at and below the village is polluted by sewage and other wastes from the village to such an extent as to give rise to foul and noxious odors and to conditions detrimental to the health and comfort of persons residing in the vicinity of the stream. The officials of the village have

been notified that a hearing on these complaints and the findings of the Board would be given to representatives of the village at the August meeting.

At the request of the board of control of the city of Cleveland, the Board extended until July 1, 1917, the date on which the city is to complete improvements to prevent the pollution of the Cuyahoga River. This action of the Board has been certified to the Governor and Attorney-General with a request for their approval.

A hearing was given to a delegation representing the villages of Dennison and Uhrichsville in regard to the pollution of Little Stillwater Creek by sewage and other wastes from these villages. Following the hearing, the Board adopted the report of an investigation which shows that this stream is polluted by sewage from the two villages and the officials of these villages have been cited to appear at the August meeting to show cause why necessary improvement should not be installed to correct the pollution of Little Stillwater Creek.

The following petitions were received and referred to the Division of Sanitary Engineering for investigation and report:

From the board of health of Hicksville Township, Defiance County, alleging the pollution of Mill Creek and laterals by sewage and other wastes from the village of Hicksville.

From the board of health of Struthers, Mahoning County, alleging that the public water supply of that village, furnished by the Mahoning Valley Water Company, is believed to be impure and dangerous to health.

From the trustees of Blanchard, Ottawa and Perry townships, Putnam County, alleging the pollution of the Blanchard River by sewage and other wastes from the city of Findlay, and,

From the trustees of Blanchard, Ottawa and Perry townships, Putnam County, requesting an investigation of the pollution of the Blanchard River by the sewage and other wastes from the Ohio Oil Company's property.

Health officers for the following villages were approved: Dr. W. E. Thomson, Antioch; Dr. C. W. Henderson, Corwin; Dr. E. E. Furnas, Englewood; Hiram Replogle, Fairfield; August Arndt, Glenwillow; F. H. Daniel, Greenwich; G. B. Henderson, LaRue; G. L. Courtrite, Marengo; L. C. Claus, Miltonsburg; C. H. Blackson, Santoy; Robert Sweeny, Wauseon.

Renewals of licenses to conduct maternity boarding houses and lying-in hospitals were approved as follows: Mrs. James T. Black, 633 West Spring Street, Lima; Mrs. Zella Briggaman, 1432 East

Rich Street, Columbus; Mrs. Eleanor Smith, rear of 163 North Ohio Avenue, Columbus; Mrs. Margaret A. Feters, 445 Highland Avenue, Columbus; The Florence Crittenton, 1166 East Main Street, Columbus.

The Board adopted a recommendation of the State Plumbing Inspector that the attention of the Attorney-General be called to the failure and refusal of Scully & Moore, plumbing contractors, Lima, Ohio, to install the plumbing and drainage in a public school building at New Bremen, in accordance with the requirements of the Ohio Building Code.

At the request of the National Tube Company at Lorain, Ohio, the Board approved the use of galvanized steel wash sinks of a pattern designed and manufactured for exclusive use in their mills in place of porcelain enameled cast iron wash sinks as specified in the Ohio Building Code. The attention of the National Tube Company was called to the fact that concurrence in this approval must be secured from the board of health of the city of Lorain.

At the request of the board of health of the city of Middletown the Board concurred in the following substitution permitted by Section 12600-277 of the General Code:

"That the waste pipe of the bath tub, basin or sink in any residence, flat or apartment house, be allowed to connect to a lead bend without reventing the closet bend providing the trap of the bath tub, basin or sink is properly vented."

The Secretary was authorized to renew a contract with the H. K. Mulford Company of Philadelphia providing for the sale to local boards of health of biological products manufactured by that company. This contract provides for the sale of such products at a greatly reduced cost to the local board of health from the retail price as charged by druggists.

The attention of the Board was called to the Second Pan-American Scientific Congress to be held under the auspices of the government of the United States at the city of Washington, from December 27, 1915 to January 8, 1916, inclusive. The Secretary was instructed to request the State Emergency Board to authorize the attendance at this Congress of one delegate and one alternate to be appointed by the President of the Board.

The following suggested order relative to the sterilization of utensils used in the operation of soda fountains was presented:

In order that the sale of ice cream, sodas and soda fountain sundries may be conducted under sanitary conditions and in conformity with the laws of the State, as provided in Section 1237

General Code, the operators of ice cream parlors and soda fountains are hereby instructed that all such goods shall be dispensed only in sterile containers.

To this end it is ordered that all soda fountains and ice cream parlors be provided with facilities for the sterilization of dippers, glasses, spoons and serving dishes and operated under the following conditions:

1. An adequate supply of pure water.
2. All dishes and utensils shall be washed by (a) rinsing in cold water; (b) thorough washing in hot water with soap or suitable cleansing powder; (c) exposure to live steam or boiling water for a period of 3 to 5 minutes; (d) rinsing in clear cold water and wiping dry before use, and after each individual serving.
3. In lieu of the above requirements, where it is found impossible or inexpedient to use live steam or boiling water, paper cups or paper tumblers with individual spoons will be allowed, for individual use only.
4. Refrigerators at soda fountains shall be kept clean by washing with hot water and soap or washing powder.
5. Employees in ice cream parlors and soda fountains shall be cleanly in person and dress, free from infectious and contagious diseases, and trained in the conduct of their work.
6. The use of straws is forbidden, except when such straws are kept protected from dust and dirt.
7. As soon as empty, ice cream containers, milk and cream cans shall be rinsed in cold water and covered, so that no foreign matter may be allowed to enter same.
8. Local boards of health, health authorities and officials, officers of state institutions, police officers, sheriffs, constables and other officers and employees of the state or any county, city or township, shall enforce this order.
9. (Penalty) The foregoing is declared to be an order and regulation of the state board of health made pursuant to the provisions of the laws of the State of Ohio. Whoever violates any provision of the foregoing order and regulation shall be fined in any sum not exceeding One Hundred (100) Dollars, or imprisoned for any time not exceeding ninety (90) days, or both; but no person shall be imprisoned for the first offense, and the prosecution shall always be as and for the first offense, unless the affidavit on which the prosecution is instituted contains the allegation that the offense is a second or repeated offense.

10. This order and regulation shall take effect and be enforced from and after thirty (30) days from the date of the passage of this order, July 12, 1915.

The Board voted to postpone action on this suggested order until the next regular meeting and instructed the Secretary to secure from all available sources, information in regard to existing laws or ordinances and the results of any investigations that have been made to show a danger to the public health from the use of unsterilized utensils.

The next regular meeting of the State Board of Health will be held in Columbus August 12, 1915.



EDITORIAL SECTION.

Public Health Work and the Length of Life.

There is no question but that the public health movement has and is rendering a distinct service to the human race. The average length of life in this country has increased about seven years during the past fifty years. In Europe the increase has been greater. At the present time the length of human life is increasing at a rate of sixteen to seventeen years per century. It has been noted with regret that at the same time there has been a marked depreciation in racial vitality and stamina. As previously stated, the increased average longevity is due to the suppression of disease in those individuals below the age of thirty-five. Public sanitation has failed to accomplish a reduction in the mortality from chronic diseases which occur after the ages of thirty-five to fifty-five. The death rates are increasing after the years of fifty-five. Along with the great increase in population there has been developed an increasing proportion of defectives. It is quite evident that something definite must be done and intensive consideration must be given to ways and means of decreasing the incidence of disease in later periods of life and of curbing the development of defectives. It is probable that the remedy for the last named situation rests in a thorough understanding of the principles of heredity and eugenics which will substantially support legislation, bringing about the regulation of marriage and the segregation and sterilization of mental defectives.

It is well stated that one of the greatest assets in the modern public health movement is public confidence. All public health legislation should have for its purpose the introduction of methods and procedures of established importance and value. In certain instances the public has approved legislation along public health lines of doubtful value and not based upon sound scientific investigation or experience. Enthusiasts have occasionally made claims and promises that could not be substantiated. It is of absolute importance that nothing be recommended about which there is any question. Practical politics should have no place in public health work. Some one has made a very true statement that politics and sanitation will not mix and the compound produced thereby is exceedingly dangerous to the public welfare. The public confidence must be preserved and cooperation sought at every turn in order to carry out the most modern and established procedure which will operate to prevent the occurrence of disease and to lengthen human life.

Why Pay Attention to Public Health?

It has long been known that there existed a certain group of diseases affecting the human race which could be prevented if proper attention were given to the ordinary laws of right living and the established principles of sanitary science. The diseases of this group cause a large number of deaths annually in every civilized community and in addition there occurs at least twice as many cases of preventable illness.

The knowledge of this situation would be all that one would think necessary to arouse public interest and action. Unfortunately, such is not universally the case. It has been shown that when the public is confronted with these facts alone only a limited response is effected. For example, when thinking people know that in Ohio in 1913, 68,399 people died from all causes and that conservative tabulations and estimates show that of this number approximately 28,000 people died from diseases which modern science knows how to prevent, and that approximately 56,000 people were ill from preventable causes, it would seem that immediate action on the part of all the thinking citizens of our state looking toward the correction of the situation would result.

Within the last five years the campaign for better health and for better living conditions has made progress. However, no general movement on the part of all our so-called public spirited citizens has yet been brought about. Again, when one investigates the exact causes underlying the progress which has been made, a curious situation is noted. It has been said that education of the public was and is the key to the solution of all our public health problems. This is true to a limited extent. Education must be the basic factor beyond doubt for all advances in civilization. But what else do we find on analyzing the situation? What other factors are now operating in stimulating the interest of the business man and the everyday citizen? One finds that very wisely the public health officials and the voluntary propagandists are now calling attention to the economic and commercial phases of the question. The value of human life is hard to estimate from an economic standpoint. Political economists and business men have given and are now giving consideration to the question of public health from the plain, and perhaps sometimes rather "cold-blooded," viewpoint of business. Certain life values have been worked out for the various trades and professions. Calculations have been made showing the relation of preventable diseases and accidents to general efficiency and statistics have been tabulated showing the loss incurred by the individual, who may be either the em-

ploye or the employer. Large industries are interesting themselves in welfare work by no means for philanthropic reasons alone, but because of the commercial importance of the problem. The same is true of the large life insurance companies. The question of postponing as long as possible the death of a policy holder is essentially a commercial proposition with the life insurance companies.

In the earlier days sanitary reforms were brought about through panic which occurred coincident with or followed in the wake of devastating plagues. Historians have not given due weight to the prevalence of disease as a factor in the political and economic rise and fall of the ancient nations.

Nowadays we must measure the success of any and all movements for social betterment from the standpoint of economics just as the success of any business must be measured on this basis. One must determine the commercial value of health conservation just as one measures the commercial value of the farm livestock or products, or the output of a manufacturing plant. Philanthropic movements supported by voluntary contributions may lead the way to many needed reforms of a sanitary or social character but such support can never be lasting unless the results can be measured in dollars and cents. In other words, the "acid test" to be applied to any movement, be it the public health movement or any other, is, "*does it pay?*" Granted that a human life is of actual commercial value, it becomes a matter of grave importance to the state and to the nation to prevent unnecessary sickness and death. Again, bearing in mind the productiveness of an individual at the various periods of life, it is most certainly a proposition for the serious concern of any government to devise ways and means of lengthening the life of its citizens.

The question will undoubtedly arise as to why, if it be true that this question is of so much economic importance, there has been so slow a development of interest on the part of the general public. The following may be stated in this connection. It was commonly accepted for many years and the view is held by some at the present time that death follows the invariable laws of nature. It is stated that man has no control over these laws and that the Almighty is responsible for the death rates which prevail. It is perhaps true that man cannot control the actual laws of nature but it has been demonstrated beyond any doubt that many of the laws of nature, which formerly were held invariable, may be materially modified. We now know that the Almighty has nothing whatever to do with the mortality in a community. The death rates of any community are determined by that community itself, that is, by the whole body social

of that community. It has been well stated that defective sanitation in a community means defective civilization in that community. Every community can within limits determine its own death rates. One can even go further and say that good public health may be purchased by any community. It is a purchasable commodity, so to speak, of which any really highly civilized community may avail itself.

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What Statistics Prove.

It has been stated that almost anything can be proven by figures and statistics. This is not necessarily the case for figures are nothing but the evidence on which certain conclusions must be based and certain statistical formulas deduced. It is, of course, obvious that if the figures in regard to births and deaths and morbidity are false that the conclusions deduced therefrom may be erroneous. It is true, however, as has been pointed out by one of our noted statistical authorities, that such a situation exists in connection with the weighing of all evidence and such statements do not apply necessarily alone to vital statistical figures. It is quite evident, therefore, that in public health work it is very necessary to have accurate figures as to the occurrence of births, deaths, and sickness. The situation in this country today is not altogether satisfactory. Approximately 65 per cent of the population of the United States is represented in the registration areas of the Bureau of the Census. In most of these registration areas accurate figures are at hand showing the number of deaths and their causes. In very few of these registration areas are complete birth returns secured and in none of these registration areas are complete returns secured in regard to morbidity or sickness. In Ohio practically all the mortality or death returns are secured but only 50 per cent of the births and 70 per cent of the cases of sickness. It is necessary, therefore, in certain instances to make carefully compiled estimates based upon the character of the population and the habits and methods of living of the people. All public health workers agree that one of the fundamental propositions in carefully administered public health work is the securing of accurate vital statistics. Disease cannot be adequately controlled unless an exact knowledge of the location of the disease is at hand. By this means, also, the various health agencies may check the effectiveness of their work. There seems to be no question but that the public must be educated as to the value of vital statistics in public health work and along with their value in this line of work must also be mentioned their legal value, which is by no means an unimportant feature.

A life table prepared by the New York City health department and based on the inhabitants of New York City is exceedingly interesting. It is a study of the statistics for the three years, 1909-1911. In 1882 Dr. John S. Billings prepared a somewhat similar table for the United States Bureau of the Census. The years covered in Dr. Billings' table were 1879 to 1881, a three year period. The two tables are just thirty years apart and comparisons are therefore instructive.

A child under five years of age thirty years ago had a life expectancy of forty-one years and at the present time the expectancy of such a child is shown to be fifty-two years. There has been, therefore, an increase in life expectancy of approximately eleven years. According to the last compiled table the expectancy decreases quite rapidly for every five year period after the five year age period until we find that adults from the age of twenty-five to thirty years have at present an expectancy of life of 34.3 years and thirty years ago such adults had an expectancy of 32.6 years. The increase in this case is only 1.7 years.

After the age of forty years one finds that the expectancy of life is less now than it was thirty years ago. The recently formulated table shows that adults (40-45 years) have at the present time an expectancy of 23.4 years where thirty years ago the expectancy at these ages was 23.9 years. There is, therefore, a decrease in expectancy of six months. This decrease in expectancy continues after forty-five years of age but is not particularly great as shown by the fact that the expectancy at eighty-five years of age at the present time is only three years and three months less than it was in 1879-1880. The question naturally arises as to the cause of this decrease in expectancy of life after the forty-fifth year as shown in comparing the two tables. This can be ascribed to the greater prevalence of diseases of the heart and kidneys, particularly those due to organic changes in the blood circulatory apparatus and to the increase in cancer and the so-called degenerative diseases. It has been stated also that more spiritous liquors are consumed in the present day and that our diet is more largely nitrogenous than it was years ago, thus causing more extensive degenerative changes. It is also claimed that the hurry and worry of our modern existence, coupled with the fact that we do not take sufficient exercise or eat and thoroughly digest enough good food, is also partly responsible.

The expectancy among females is shown to be greater than among males up to forty years of age and thereafter the expectancy is less.

In summarizing, it may be said that at the age of forty more people are now living in comparison with the number born than thirty years ago. However, after the fortieth to forty-fifth year the expectancy is decreasing and in proportion to the number born there are fewer old people now than thirty years ago.

* * *

Why Do Health Conditions Vary?

There are many possible reasons easy to advance in answer to the question "Why Do Health Conditions Vary?", setting aside the question of location, climate, density of population and so on. We have been quite forcibly impressed with one feature as a result of observations which have been made in connection with a sanitary survey of schools, which the State Board of Health has been conducting in one of the typical counties of the state of Ohio. The organization here, as everywhere, is that of the county divided into school districts. Hence the opportunity for comparing the conditions in one district (these were all country districts) with those in another were very good. Most of these districts were similar in every particular, especially in population and wealth. All of these districts were in wealthy farming communities, as proven by the excellent homes, enormous barns, fine fences, good roads, Grange halls and churches.

In one district, country schools would be found to be the same old buildings erected forty to fifty years ago, without wells, with the crudest type of outside privies, the school building itself lacking in proper heating and ventilating arrangements, poorly lighted, with dark and dingy walls and ceilings, a bucket with a common cup, a common towel, and floors too rough and full of cracks to be properly cleaned, and a "dollar a month," or perhaps nothing, appropriated for janitorial services. In an exactly adjoining district, perhaps in sight of the same buildings, all of the conditions above mentioned would likely be found the exact counterpart,—in a word, safe, sanitary, hygienic and pleasant places to harbor the children for their schooling, and with appropriate funds devoted to the care and up-keep of the buildings and grounds.

We can only reach the conclusion that the difference in conditions is entirely a matter of the absence of an agitation in the former type of district, or, perhaps, better, the absence of an agitator to call attention to the slovenliness and oblivion which exists.

After all, the care of our health and the health of our children appears to be a matter of entirely local interest, which may be absent

in one square mile, but of daily concern in the next square mile. If we were to allow our big cities to be built up on this plan, with fire-traps and disease-traps in one block, and fireproof structures and sanitary improvements in the next block, "What Would People Say?" Such today is the chaotic condition of "How Healthy Is My Community?"

* * *

Physicians and the Law.

Physicians are usually considered to be good citizens and as a general rule the profession justifies this belief. The large majority of physicians are upright and honest, and the moral standard is probably as high or higher in the medical profession as in any other equally tempted body of men. This does not mean that actual crime may not be committed by physicians, nor does it mean that carelessness and inefficiency may not be found in the rank and file. As an instance of this, the fact that only about half the cases of typhoid fever in Ohio in 1914 were reported may be cited. In 1914, 912 deaths from typhoid fever were certified in Ohio. This means that at least 9,120 persons suffered from the disease during the year. Only half this number, or 4,796 cases, were reported. In other words, physicians and health officers failed over four thousand times in 1914 to obey and enforce a law of utmost importance to the health and happiness of citizens of Ohio. The law of Ohio requires physicians to report to health officers, and health officers to report to the State Board of Health all cases of typhoid fever which occur. It may be assumed that in a number of instances the diagnosis was in doubt, and that in a small number of cases no physician was called. Nevertheless, in nearly four thousand instances the law was broken without excuse and without comment. In the last issue of the Ohio Public Health Journal cases were cited showing that courts have upheld the constitutionality of laws requiring reports of cases in many states and on many different occasions. Liberal interpretations have been given to many such statutes, and one justice has stated that if a "regulation, enacted by competent public authority, avowedly for the protection of the public health, has a real, substantial relation to that object, the courts will not strike it down upon grounds merely of public policy or expediency." (199 U. S. 306, at p. 318.) Other courts have held that reports may be required in writing, and in fact have indicated that in every prosecution against persons who fail to comply with the laws of the states or regulations promulgated by competent

bodies, a broad view of the statutes or regulations will be taken and the public health considered paramount.

What is the importance of reporting cases of typhoid fever? Investigators are a unit in declaring that in every case of typhoid fever is a potential source of others. Investigations to determine the source of an outbreak fail unless all cases are included. Finally, a reduction in the typhoid death rate has only been effected in the majority of instances by a close study of each reported case. This has been the case in New York, Cincinnati, and other cities where marked reductions in the typhoid death rate have been effected. In the face of such evidence no one will dispute the importance of complete reports of all cases of typhoid fever.

* * *

Diphtheria and Christian Science.

On July 17 a four-year-old son of Christian Science parents in a city in Ohio became sick with what the father thought was a cold. The matter was referred to a Christian Science practitioner in a nearby city who gave "absent treatment." Strangely enough, the boy grew worse in spite of this "absent treatment" and some "present treatment" or "demonstrations", said to have been given by two Christian Science practitioners in the home city. On the morning of July 20th the symptoms grew so alarming that a licensed physician was called in "for diagnosis only." This physician found the neck swollen and glands enlarged and while unable to secure a satisfactory view of the throat, came to the conclusion that the disease was tonsillitis or quinsy with the possibility of diphtheria. The extremities were cold and the pulse rapid and weak. As soon as the physician informed the parents of her views as to the diagnosis she was dismissed and all her recommendations as to treatment were completely ignored. Presumably under the influence of the miraculous Christian Science "demonstrations" the child, probably without any nursing attention, sank rapidly and died in the evening of July 20th. When the licensed physician who had been called heard of the death, she informed the health officer and signed the death certificate "diphtheria". The house was quarantined and all exposures placed under observation.

On July 22d, the seven-year old sister of the dead boy developed sore throat and other symptoms suggestive of diphtheria. Owing to pressure from non-Christian Science friends, a physician was called. He made a diagnosis of diphtheria, took a culture, which the laboratory of the State Board of Health found positive, and recommended anti-toxin. The parents refused their consent, but later allowed the

physician to give eight thousand units. Under the influence of the antitoxin the membrane cleared rapidly, but on July 23d the pulse was rapid and weak and the patient still prostrated. The bowels were also constipated. The physician recommended throat washes, stimulants and cathartics, but the family while outwardly consenting, did not give any of the treatment recommended. Word has since come from the licensed physician who was called, that following a visit by a health inspector the family consented to follow the physician's directions and the child is now on the road to recovery. These two cases require very little comment. It is impossible for the normal parent to understand the mental attitude of this father and mother, whose only son died as a result of their neglect, and whose only daughter was allowed to hover on the threshold of death. Legislative action is needed to put an end to such credulity. No fault need be found with those who adopt Christian Science as a *religion*, but the criminal negligence of parents in failing to provide proper medical and nursing attention, and the resulting cruelty to children, innocent sufferers of their parents' ignorance and obstinacy, must be stopped. Those who enrich themselves by practicing a so-called "science" which is ignorance, and imperiling the health of those who through no fault of their own, happen to be the sons and daughters of Christian Scientists, should be persistently prosecuted. The press must be utilized to spread broadcast news of just such incidents as that which forms the basis of this editorial. In other words the practice of medicine and the care of the human body must not be left to neurotic men and women who have no other foundation for their work or "demonstrations", than Mary Baker Eddy's "Science and Health". Contrast the equipment and training of a physician with that of a Christian Science practitioner, and remember that trained men in all lines of work are the foundation of modern civilization, while untrained persons in all lines of work are impeding progress and endangering lives everywhere. The Christian Science practitioner assuming to treat the ills of the human body is just as presumptuous as a private soldier who would undertake the command of a great army without previous training and experience. As a matter of fact more lives would be sacrificed by the former than by the latter course.

CURRENT COMMENT ON MATTERS OF PUBLIC HEALTH AND SANITATION.

The Present Status and the Future of Hygiene or Public Health in America.*

During the past few years, an increasing and now insistent demand has been heard in this country for better facilities for the training of public health officials. There is an awakening of interest in that branch of science known as hygiene or public health, and it becomes a matter of vital necessity for those of us who are working in this field to clearly formulate the underlying principles of this science, its scope and its needs, and present them to the public and especially to those who hold the fate of our great institutions of learning in their grasp and under their direction.

HYGIENE IN GERMANY AND AUSTRIA.

The modern conception of hygiene was given the continent of Europe by Max von Pettenkofer, the first professor of hygiene in any German university. During the latter half of the nineteenth century, typhoid fever, Asiatic cholera and other zymotic diseases spread like wildfire from person to person when once started in a community. Pettenkofer not only realized the inadequacy of the methods employed to limit the spread of disease, but he also saw that the fundamental difficulty lay in the ignorance of the medical profession in regard to the mode of transmission of infections. Pettenkofer demanded that the various facts relating to disease "en masse" should be thoroughly studied by experts, that after the fundamental facts had been observed, theories to explain these facts should be formulated and submitted to the rigid test of experiment, to the end that proper conclusions from fact, theory and experiment might be drawn and measures in accord with these conclusions be carried out.

This radical movement in hygiene made a profound impression upon Europe, especially upon Germany and Austria. Professorships were established in the leading medical schools, first in Bavaria and then in other parts of the German empire, thoroughly trained men were put in charge of the administration of sanitary laws, and the attempt made to limit the spread of the infectious diseases by scientific methods. A special corps of sanitary police was instituted, the mem-

* Abstract of Article by Ford, John Hopkins — Science. 1915.

bers of which were given extraordinary powers so that they could visit every quarter of the city and enter every dwelling to enforce the execution of the new sanitary laws. As a result of these changes, the mortality from zymotic diseases fell rapidly and typhoid practically disappeared.

Pettenkofer's school of hygiene was developed in the days before modern bacteriology was dreamed of, the etiological agents of disease were unknown and much of the work of the great investigators had to be carried out upon a hypothetical basis. With the rise of the new science of bacteriology as the result of the investigations of Robert Koch, this first school of hygiene received a staggering blow. Gradually, however, the newer and more correct theories of the modern bacteriologists supplanted the older theories of the Pettenkofer school and in 1885 Koch became professor of hygiene and bacteriology in the university of Berlin. This set the pace, and within the next few years the various professorships of hygiene, as they became vacant, were filled by the appointment of men trained in the modern bacteriological technique.

Despite the great diversity in training of the various hygienists in Germany and Austria, the subjects they teach and study are much the same in the different universities, approached necessarily, however, from different viewpoints. The fundamental principles of hygiene as applied to vital statistics, heating, lighting, ventilation, clothing, disinfection, sanitation, water and milk supplies, sewage disposal, nutrition and food values, are taught to all medical students, while special emphasis is laid upon demonstrations which show the mode of transmission of the infectious diseases. Lecture courses in theoretical hygiene are compulsory, laboratory courses in practical hygiene are attended by the majority, and all students who are candidates for degrees in medicine must pass a rigid examination in hygiene before graduation. Hygiene is a distinct scientific entity in Central Europe today, the object of whose teaching is the demonstration of all the available facts and theories relating to disease in bulk as distinguished from individual cases of disease.

HYGIENE OR PUBLIC HEALTH IN GREAT BRITAIN.

During the period which saw the establishment of hygiene on a modern basis in Germany and Austria, the same science was being developed in England under the name "public health". In 1872 a new Public Health Act forced every sanitary authority outside of London to appoint a medical officer of health. As a result of this act it became apparent that the supply of men trained in sanitary science to occupy

positions as public health officers was inadequate, and the University of Cambridge set about the task of educating the medical health officers to be trained sanitarians as well. A diploma was granted to be recognized as the Diploma of Public Health. (D. P. H.).

The example set by Cambridge was soon followed by other universities and medical schools, and courses of instruction in hygiene or public health were offered. The candidates studied the principles of sanitary science in their application to public health problems, "air, water, soil, sewage, food, climatology, bacteriology, parasitology, and the general pathology of diseases of animals transmissible to man, etc." Following this they received instruction in sanitary engineering, food inspection, epidemiology, occupational hygiene, vital statistics and public health laws. It was also required that the candidate should study public health administration under a qualified medical officer of health and that he should attend a hospital for infectious diseases and acquire training in diagnosis and in preventive methods.

In addition to the men who expect to enter upon an administrative career in public health in Great Britain and who are now required to obtain this diploma, many medical graduates take the D. P. H. as a post-graduate degree corresponding somewhat to our Master of Arts, and a large number of the most eminent scientists in the medical profession there are holders of diplomas in public health. Whatever else may be said of the public health instruction in Great Britain, it must be admitted that this system has resulted in an enlightened control of sanitary measures by competent authorities, which is not surpassed by any other country in the world.

HYGIENE OR PUBLIC HEALTH IN FRANCE.

Since 1848 the administration of health laws has been on a firm and scientific basis in France and many medical men of prominence have been members of the various councils of health. The Pasteur Institute in Paris, originally designed for the study of rabies and the preparation of anti-rabic inoculations, soon took on the character of a general bacteriological and hygienic institute, in which the problems of all the infectious diseases were investigated. Hygiene is an important part of the medical curriculum and a number of standard publications are devoted to it.

HYGIENE OR PUBLIC HEALTH IN AMERICA.

In American universities and medical schools, while science was early recognized as a major subject by many of the leaders in medical education, this feeling was by no means widespread. Nevertheless

important beginnings were attempted and in some instances splendid results followed. As early as 1865, the year von Pettenkofer became professor of hygiene in Munich, the Medical College of the New York Infirmary for Women and Children made hygiene and public sanitation a compulsory part of its curriculum. The University of Michigan, when its medical department was founded in 1850, taught the principles of the sanitary analysis of drinking water, and in 1876 a course of lectures was given by the professor of hygiene. In Western Reserve, in Cleveland, state medicine and hygiene were taught as early as 1881. In Harvard, lectures on hygiene were given in 1876 and the present department of preventive medicine was established later as a department of hygiene. In 1892 the institute of hygiene of the University of Pennsylvania was established with Dr. Billings in charge. With the exception of Michigan, Pennsylvania and Harvard, the hygiene which was taught in America was presented either by practicing physicians or by health officers whose time was largely occupied by administrative duties and who gave brief and in general unscientific lectures upon public health topics.

Recently Western Reserve has reorganized its work in hygiene and has appointed a full time professor in this branch; a similar change has taken place in Yale, and the University of Chicago has also established such a department. Hygiene as a major subject, with a trained scientist giving up his entire time to teaching its principles and studying its problems, exists in but six of our thirty-eight medical schools today. What a pitiful showing this makes in comparison with Germany and Austria-Hungary, where all the universities where medicine is taught have their hygienic institutes, or Great Britain, where every graduate in medicine must follow courses in public health and pass examinations in it.

There is probably no field in which medical men need training more than in hygiene and in no line of work will its efforts be more beneficial or more appreciated by the community than in the prevention of the spread of infectious diseases by the application of the sound principles of sanitation. The indifference to hygiene as a science lies in our universities and in our medical schools and the responsibility for the failure of its development rests clearly upon them.

PRESENT NEEDS.

Every man who graduates from a medical school should be taught, some time during his course, the underlying principles of hygiene. He should understand ventilation, food values, water and milk supplies.

and how a city should dispose of its sewage. Especially should he be taught the mode of transmission of the infectious diseases and the methods of their prevention. This knowledge he should have that he may advise his patients properly and safeguard their health, and that he may play his part in the community and lift his voice on the right side concerning that branch of city and state government which most concerns him, the department of health, too often, alas, merely a pawn in the hands of unscrupulous individuals to do more as they see fit in the great game of politics. To accomplish this purpose, namely the education of the physician, every medical school in this country should have its department or institute of hygiene, in charge of a full time man with a corps of trained assistants. It makes little difference whether the head of this department is a chemist, a bacteriologist or a physicist, since the problems of hygiene must be approached from various angles, but in the organization of the department, provision must be made for teaching the subject with reference to chemistry, bacteriology and physics. It is not sufficient to teach what we know at present about hygiene. The bounds of our knowledge must be constantly widened, new facts acquired and new theories tested.

The second great need in this country is for better facilities for the training of public health officers. The awakening of the public conscience to the necessity of removing health questions from the domain of politics has resulted in the reorganization of many of our municipal and state departments of health. There is a distinct demand for specialists in public health, and this can best be met by organizing courses leading up to the Diploma of Public Health or some similar degree, the position of which will guarantee that the holder has received expert instruction which will qualify him to act intelligently as an officer of health. Already three of our best medical schools have organized such courses and other universities are contemplating similar enterprises.

The third need is to educate the great mass of the people who are engaging in all sorts of philanthropic enterprises which border on medicine. This education of the people in matters affecting their health can probably be best given in a museum of hygiene where models of all sorts of apparatus, collections of charts and statistical materials can be made available for study and where public lectures can be given. If possible, let us first educate our medical students, then our officers of health, then the public. Should the order be changed, however, no great harm will result. Should this country be so fortunate as to see schools of hygiene attached to the medical departments of our univer-

sities properly endowed and aiming to satisfy all three needs, then indeed shall we be fortunate beyond the wildest dreams of the most enthusiastic student of the subject.

Keeping Cool.

HOW TO KEEP COOL IN SUMMER.

The gentle art of keeping cool is not to be despised these days. Here are just a few little hints which, while they won't make the thermometer register 65 or 70 instead of 90 or 100, will go a long, long way toward mitigating one's personal suffering.

First of all, keep the organs of elimination, especially the bowels, working easily and frequently. Do this by eating fruits and vegetables, leaving off meats and pastries, and by drinking lots of cool (not ice cold) water and buttermilk instead of coffee.

Dress right. Wear palm beach clothes if possible, and wear as little as the law of the land will allow. That's mighty little these days — equal rights for men. In the words of the wag, we are "sorry for some of the ladies in summer, for a few of them don't have much left to take off."

Build that sleeping porch now that you have been thinking about it so long. You'll enjoy it so much you will want to use it the year round. In the old-fashioned closed-in houses, our electric fan on low speed is a delight these hot nights in the bedrooms.

Last of all don't worry, fret, or get cross and vexed. Keep sweet. Don't try to do as much physical work as at other times. Manage to do as much of your work in the shade as possible. Keep on very intimate terms with the bath tub and forget the weather. Don't talk about it. Give that subject a rest. The other fellow will thank you for it.—*North Carolina Press Bulletin*, 1915.

Care of the Baby in Summer.

DESTROY THE FLY.

When the modern mother sings "Baby-bye, here's a fly" to her infant, she changes the second line of the old nursery song to read "Let us *sawat* him, you and I." The common house-fly is no longer an object of tolerant interest, but has become an object of hatred and distrust. He is known to be the principal factor in the distribution of the germs of typhoid.

Especially is he regarded as the enemy of the baby, as there is reason to believe that he carries about the germs of summer diarrhea

and leaves them behind him, with other filth, when he lights on the nipple of the feeding bottle, or crawls over the saucer of cereal, or falls in the milk. Thus he is a real danger, not only to the baby but to the whole family, and every effort should be made to do away with him.

Flies may be kept out of the house to a considerable extent by using screens at the doors and windows, and those that get inside may be trapped, poisoned, or swatted. But better than any of these methods is to destroy the flies in the larval stage, and thus prevent them from hatching. The following information is furnished by the Department of Agriculture:

"A safe and effective weapon against the typhoid or house-fly has been found in powdered hellebore by scientists of the Department of Agriculture. Flies lay their eggs chiefly in stable manure. Powdered hellebore mixed with water and sprinkled over the manure, will destroy the larvae which are hatched from the eggs. Since powdered hellebore is readily obtainable, this puts in the hands of every one a remedy for one of the pests that has been found dangerous as well as troublesome. Powdered hellebore, however, will not kill adult flies, which must be swatted or trapped.

"It has long been known that flies breed in manure but previous methods of destroying the larvae there by the use of strong chemicals have been open to the objection that the treatment under some conditions lessened the fertilizing value of the manure or actually injured vegetation. This is not true of powdered hellebore. Government experiments have shown that the hellebore is entirely decomposed in the course of the fermentation of the manure and that even in excessive quantities it does no harm except to the larvae it is intended to destroy. Chickens picking in manure treated with it suffer no ill effects.

"One-half pound of powdered hellebore mixed with 10 gallons of water is sufficient to kill the larvae in 8 bushels, or 10 cubic feet, of manure. The mixture should be sprinkled carefully over the pile, especial attention being paid to the outer edges. In most places hellebore is obtainable in 100-pound lots at a cost of 11 cents a pound. This makes the cost of the treatment a little less than seven-tenths of a cent per bushel of manure. A liberal estimate of the output of manure is two bushels a day per horse. The money involved is, therefore, trifling in comparison with the benefits to the individual and the community from the practical elimination of the disease-spreading fly.

"Although fresh manure is the favorite breeding spot, flies lay their eggs in other places as well, such as outhouses, refuse piles, etc. In these places, from which no manure is taken to spread on the fields,

considerable saving may be effected through the substitution of borax for powdered hellebore. Applied at the rate of 0.62 pounds per 8 bushels of manure, borax is as effective as powdered hellebore in killing the larvae, but costs less than half a cent for each bushel of manure treated. In larger quantities, however, or when the manure itself is spread at a greater rate than 15 tons to the acre, some damage to crops may result. Large quantities of manure are often used by market gardeners and others, and there is always danger of carelessness in applying the borax. The use of the more expensive but safer hellebore is therefore recommended for the treatment of manure. Borax is recommended for all other refuse in which flies may lay eggs.

"Scientists who have been working for years to eliminate the fly are convinced that the use of one or the other of these simple measures is a public duty wherever manure and refuse exist. Sanitarians, however, strongly advise the removal of refuse heaps or other unnecessary rubbish or breeding places for flies. In breeding places which cannot be thus disposed of—such as manure stables—the daily use of powdered hellebore will keep the flies from breeding in these favorite breeding grounds. The best results are obtainable in a community where every one cleans up his premises, traps or kills the flies, and systematically treats the manure and other breeding places with powdered hellebore.

"The fly is not only a nuisance to human beings and live stock; it spreads disease and filth and is a menace to a public health which cannot be tolerated in the fact of a demonstrated remedy. Details of the experiments with other information on the subject are contained in a professional paper, Bulletin 245 of the United States Department of Agriculture."—*U. S. Public Health Service*, 1915.

Care of the Baby in Summer.

MINOR AILMENTS.

A baby may be made uncomfortable and restless by various causes which are readily removed. Attention has already been called to the fact that babies and young children frequently suffer from thirst. They should be offered a drink of water several times a day, and particularly in hot weather. When a baby cries in the night, a drink will often quiet him, and send him to sleep.

Irritating clothing is at times responsible for the baby's fretfulness. Woolen socks, or shirts, or stiff cap strings are quite enough to spoil his comfort, even if he is well, and, in hot weather especially, a

superabundance of clothing is frequently responsible for much real suffering.

Dress the baby in the lightest cotton garments and keep him as cool as possible. Do not be afraid to let him have nothing on but his diaper and one other thin garment on the very hot days.

Prickly Heat:

One of the troubles from which a baby often suffers in summer is prickly heat. This ailment appears as a fine red rash usually on the neck and shoulders and gradually spreads to the head, face and arms. It is caused by overheating, due either to the hot weather or to the fact that the baby is too warmly dressed. The rash comes and goes with the heat, and causes intense itching. The remedy for it is to take off all the clothing and give the baby a sponge bath in tepid water in which common baking soda has been dissolved. Use one tablespoonful of soda to two quarts of water. Use no soap, and do not rub the skin, but pat it dry with a soft towel. After the skin is thoroughly dry, dust the inflamed surfaces with a plain talcum powder.

This ailment, like all others, is more readily prevented than cured. Frequent cool baths, very little clothing, simple food and living in cool rooms, or in the open air will probably save the summer baby from much of the annoyance of prickly heat and other more serious ills.

Chafing:

Fat babies are very apt to suffer from chafing, especially in hot weather. It appears as a redness of the skin in the buttocks or in the armpits, or wherever two skin surfaces persistently rub together.

Much the same treatment is required as in prickly heat. Never use soap on an inflamed skin. Instead use a soda, bran or starch bath. Directions for these baths are given in a publication called *Infant Care*, which may be had, free of charge, by addressing a request to the Chief of the Children's Bureau, U. S. Department of Labor, Washington, D. C.

Great care should be taken not to let the baby scratch the skin, when it is irritated. Sift together two parts powdered cornstarch, and one part boric acid, and use it freely on the chafed places. Remove wet or soiled diapers at once. Wash and dry the flesh thoroughly, then dust the powder freely between the legs.

Milk Crust:

This is a skin disease affecting the scalp, in which yellowish, scaly patches appear on the baby's head. These patches should be softened by anointing them with olive oil or vaseline at night, and the head washed with warm water and castile soap in the morning.

If the crust does not readily come away, repeat the process until the scalp is clean. Never use a fine comb nor the finger nails to remove the crusts, as the slightest irritation of the skin will cause the disease to spread further. The scales will usually disappear after a few days of careful treatment.

Constipation:

If the baby does not have at least one full bowel movement in 24 hours or in 36 at the outside, he is in need of such care as will bring about this result. Breast-fed babies often respond to an increased supply of laxative food in the mother's diet. If this is not sufficient, a six months old baby may have a tablespoonful of strained orange juice between two of his morning feedings.

Bottle-fed babies may have fruit juice in the same way and thin oatmeal gruel may be substituted for barley water in making up the feedings, after the baby is four months old.

Perhaps the best preventive of constipation is to teach the baby to move the bowels at the same hour every day. This training should be begun when the baby is three months old, and should be faithfully continued until the habit is firmly established. Not only does this practice establish in the baby from the beginning of his life a custom which will greatly increase his chances for good health, but results in an enormous saving of work to the mother. She no longer finds herself confronted with a pile of soiled diapers to wash, but instead gives fifteen minutes of careful attention to the baby each morning.

Directions for carrying out this training are given in the pamphlet on *Infant Care* (already mentioned.) Do not use enemas for the relief of constipation save in emergencies, and do not resort to purgative medicines except with the doctor's advice.—*U. S. Public Health Service*, 1915.

Harvest Disease Due.

U. S. PUBLIC HEALTH SERVICE EXPLAINS ITS NATURE.

Although of brief duration, the harvest disease, as it is commonly known, is one of the most annoying and troublesome complaints of the summer season. It is of frequent occurrence, seldom recognized, and widely disseminated. The disease is generally ascribed to errors of diet, over-exertion or poisoning, and but few of the afflicted are aware that the cause of their suffering is a minute six-legged insect.

The "jigger," "chigger," or harvest mite, which occasions this vexatious summer eruption, belongs to the mite family. This in itself

is sufficient to cause some doubt in the minds of the enlightened, inasmuch as several other members of the family have gained fame through misbehavior. The itch mite is a notorious example. It has been with us since history began and still afflicts the human race. The straw mite, only recently discovered, is also acquiring somewhat of a reputation.

The adult jigger is harmless. It apparently loves the freedom of the woods and open fields, attaching itself to leaves and grasses and utterly ignoring all human intruders. The young are hatched in July and August and appear from the eggs as minute orange-red larvae. For some inexplicable reason they show a considerable predilection for human society, willingly forsaking their natural habitat for the uncertainties of life with man. When lodged upon the skin they immediately select a favorable site and rapidly begin to penetrate the outer layers by burrowing. The trouble begins at this stage. The irritation, at first mild, becomes intense as the burrowing proceeds and is accompanied by redness, swelling and inflammation. Frequently the eruption resembles that of hives or even eczema and the itching is so severe that lesions due to violent scratching may ensue. The irritation may be confined to particular portions of the body or become widespread. Depending upon the number of larvae entrenching themselves, the suffering may be acute, preventing sleep and even leading to other disturbances, while at the best the degree of uncomfортableness is such as to demand remedial measures. Just why the larvae exhibit burrowing proclivities in this manner is unknown; their action is apparently without reason as they invariably perish within a few days after commencing their nefarious attack. Their demise is most welcome to the sufferer. As with other parasitic diseases, the susceptibility of individuals varies considerably, some persons not suffering even when thoroughly exposed.

Early treatment of jigger rash or trombidiosis, as it is known, is essential. If the condition is recognized at its onset the sufferer can almost invariably point with exactness to the burrowing sites and frequently the disappearing extremities of the intruders may be observed. A needle, sterilized by boiling, may be used to pluck the invaders from their dermal intrenchments, and even if the search proves unsuccessful, the counter-irritation produced by the instrument is pleasurable, and affords great enjoyment to the afflicted. If the swelling or oedema of the skin is considerable, or if the lesions are not recent, search will prove futile as the larvae are already safely buried. One can then only hope for an early termination of their activities, this usually requiring from five to seven days. Several extremely useful prepara-

tions are prescribed by physicians not only to kill the mites but to reduce the irritation and relieve the itching. Bathing directly after exposure is advisable in order to drown the parasites. The best treatment is, however, the avoidance of the haunts of the tormentors.—*U. S. Public Health Service, 1915.*

Spread of Disease by Rodents.

That the migratory habits of rodents have a bearing upon the spread of disease is not generally known, but the United States Public Health Service, as a result of experiments conducted in plague epidemic work at New Orleans, asserts that such is the case. This is but another illustration that the field of preventive medicine is especially broad, and investigators therein must be thoroughly familiar with the life history and habits of flies, mosquitoes, ticks, and even rodents.

Several hundred captured rats were marked for purposes of identification by having their ears punched, care being taken not to render them conspicuous, as fellow-rodents wage relentless warfare upon those which appear different from their kind. They were then released in the heart of the city, and allowed to shift for themselves. Trapping was carried on in all sections, and each rat was labeled as to the locality caught. Fully one-quarter of the rats made widespread excursions, that is they were recaptured at points from one to four miles from where they were liberated. In one instance, a rat traveled 19 blocks, crossing one of the widest and busiest streets in the city, where there was no subterranean passage, and was retaken within 60 hours from the time of its liberation. From the experiments it is concluded that the semi-domesticated rat has migratory habits similar to wild animals, and that these habits are influenced by abundance or scarcity of food, facility for harborage, or the presence of natural enemies. It is also believed that certain inexplicable instincts tend to make the rat a wanderer. That in this instance the "homing" instinct was not responsible for the migration was clearly proven.

This migratory habit of rodents explains many facts connected with the dissemination of plague; it will also doubtless prove enlightening to those who have attempted to exterminate rats for economic reasons. The Indian Plague Commission was of the opinion that rats seldom journeyed from one section of the city to another, but the conclusion of the Public Health officials is quite the opposite. As a measure of the success of trapping operations, it is interesting to note that over one-half of the rodents liberated were recaptured within a month.—*U. S. Public Health Service, 1915.*

Typhoid in the Large Cities in the United States in 1914.

The study of the typhoid fever mortality rates in the large cities of the United States for 1914 shows a marked improvement over previous years. The 57 cities of 100,000 population, or over, have an average typhoid death rate of 10.38 per 100,000 as compared with 12.77 in 1913 and 19.59 in 1910. Four cities—Cambridge, Worcester, Bridgeport, and Seattle—are in the high honor list with typhoid death rates under 5. The highest rates are in Nashville, 47.3, Birmingham, 40.2, Atlanta, 38.9, and Toledo, 36.3.

Among the cities with a population over 500,000, the lowest typhoid death rate is 6.2 in New York, with 7.1 in Chicago, 7.4 in Philadelphia, and 8.3 in Cleveland. Baltimore brings up the rear with 22.4. In the second group of cities, 300,000 to 500,000 population, Seattle with 4.6 and Cincinnati with 6.0 show the best record and New Orleans the highest rate—21.5. In the third group, 200,000 to 300,000 population, Portland, Oregon, and Jersey City have the lowest and Louisville and Indianapolis the highest rates. Columbus ranks seventh out of the ten in this group with a rate of 13.1. In the group with populations from 125,000 to 200,000, Worcester and Omaha have the lowest rates and Toledo, Atlanta and Birmingham are at the bottom of the list with rates above 36.0. Memphis, which had a high rate in 1913, failed to report for 1914. In the final group 100,000 to 125,000 population, Cambridge, Massachusetts, achieves the low record for the year, 1.8 per 100,000, with Bridgeport, Connecticut, second with 3.4. Dallas, Texas, with 35.2; and Nashville with 47.3, have the worst records.

The high typhoid rate of Toledo, the highest of any northern city, appears on the face of these reports to be the most inexcusable feature of the whole typhoid situation. High rates are to be expected in the newer cities in the less progressive southern states, but it is difficult to understand why an Ohio city with a water purification plant, and apparently with every facility for controlling the disease, should have a typhoid rate of 36.3.—*Abs., J. A. M. A., 1915.*

Typhoid Fever is Preventable.

Four hundred thousand persons incapacitated, and thirty thousand lives lost—this is the heavy toll exacted in the United States each year by the scourge of typhoid fever. And typhoid fever is a preventable disease.

A recent bulletin of the United States Public Health Service entitled "Typhoid Fever—Its Causation and Prevention", states that

within the past ten years few of our communities having as many as two thousand persons have remained free from this disease for any period of twelve consecutive months. In recent times the rate of its prevalence for the United States as a whole has been from two to five times as high as in some of the countries of Europe. In these European countries the typhoid rate was formerly higher than the present figures for the United States. Their great reductions in the ravages of the disease have been brought about by improvements in sanitary conditions.

In many American cities there has occurred within the last twenty years a considerable reduction of typhoid fever. Due in a large part to improved sanitary conditions in the cities, the typhoid rate for some entire states has shown a material decrease. For the country as a whole, according to available figures, the rate has been reduced about 50 per cent in the past 40 years. But the present rate is about the same as that which prevailed in some of the other advanced nations of the world 30 years ago. In other words the United States is a generation behind the times, in respect to the reduction of its typhoid rate.

Practical and efficient measures for the prevention of typhoid fever are definitely known, but the efforts to get the people of the average self-governing community to carry out these measures to a reasonable extent are oftentimes decidedly experimental in character. In many instances the cost of modern sanitary improvements has been an obstacle in the way of typhoid prevention. It is often difficult to convince the governing authorities that money expended in the protection of the public health yields large dividends.

In rural communities and small municipalities another factor—the instruction and co-operation of the individual property owner—enters into the problem. Here every home must have its own method of sewage disposal, and in most cases its own water supply. The Public Health Service bulletin above referred to deals in a comprehensive way with the construction of wells and outhouses.

In recent years a specific method for increasing individual resistance to typhoid germs has been employed. This is known as anti-typhoid inoculation or "vaccination." This method has been used extensively in military organizations of the United States, and from the results obtained it appears that inoculated persons are, upon equal exposure to typhoid infection, less than one-fourth as likely to develop the disease as those who have not been inoculated and who have previously had the disease. The average duration of protection given by inoculation has not been determined, but is supposed to be about two years.

It is pointed out, however, that the protection given by anti-typhoid inoculation is relative, not absolute, and that such inoculation is not to be regarded as a substitute for sanitation.—*U. S. Public Health Service*, 1915.

Post-Vaccination Tetanus.

Dr. John F. Anderson, Director of the Hygienic Laboratory of the United States Public Health Service, has made an exhaustive study of the relation of vaccine virus to tetanus. He finds that there have been over 31,000,000 vaccinations in the United States during the ten-year period 1904-1913, inclusive, and in the same period there were only 41 authenticated cases of tetanus in persons recently vaccinated. The average incubation period of these cases, counting from the date of vaccination, was 22 days, and the fatality percentage 70.7. An earlier study of 52 cases by Willson shows a fatality of 78.8 and an average incubation period of 19.4 days. It is well known that in tetanus the fatality rate is higher in cases with an incubation period of less than ten days and that in cases with a longer incubation period the fatality is usually less than 50 per cent. The high fatality rate in the cases of post-vaccination tetanus would, therefore, indicate an infection of tetanus germs subsequent to vaccination in a majority of these cases. Many of the cases studied give a history of the removal of the vaccination scab, thus permitting infection of the wound.

Repeated attempts have been made to infect susceptible animals with tetanus, from germs purposely placed in vaccine virus, but without success. During the past 13 years, virus sufficient for the vaccination of over 2,000,000 persons has been examined for the organism of tetanus, and in no instance could the tetanus germ or its toxin be found. In the past ten years, there have been about 585,000 vaccinations in the United States army and navy without a single case of tetanus following the operation. In view of these facts, it may be safely asserted that when vaccination is properly performed and the wound protected from subsequent infection, there is no danger from tetanus.—*Abs., Public Health Report*, 1915.

The Beginning of Syphilis.

Unlike other diseases, syphilis did not appear upon the stage of history gradually and indefinitely; it suddenly sprang into prominence in a certain year and that was the year of the discovery of America. Although local genital diseases have been recognized from ancient

times, we have no record in ancient writings of a disease whose symptoms resembled syphilis. In other words we have no history of a disease whose local lesion was followed by constitutional symptoms. "No single authentic document has been found in ancient literature in which a description of syphilis can be recognized." The epidemic of syphilis at the end of the fifteenth century, profusely written about by medical authors and referred to by all as a hitherto unknown disease, is associated with the conquest of Naples by Charles VIII of France and his army of mercenaries in 1492. In a short time the soldiers succumbed to the luxurious forms of dissipation practiced by the Neapolitans and were in turn driven out of Naples and scattered through Europe. Records of that period are a unit in attributing the quick spread of syphilis in Europe at that time to the scattered remnants of Charles' army. The disease appeared in France, Germany and Switzerland in 1495, in Holland and Greece in 1496, England and Scotland in 1497, and to Hungary and Russia in 1499. The horror and disturbance caused by the advent of this new disease is shown by the action of the Parliament of Paris, which decreed that all persons infected with the disease should leave the city within twenty-four hours. The Scottish Privy Council passed an edict ordering all persons in Edinburgh afflicted with the disease to be banished to the island of Inchkeith near Leith. There was a tendency on the part of all people to shift the responsibility for the disease by naming it the French, Spanish or Italian pocks, in accordance with the location.

From Europe the disease quickly spread to all parts of the inhabitable world. It was introduced into the Orient only after contact with Europeans, and it was not recognized in Japan until 1569, when its appearance in Nagasaki was attributed to Chinese or Portuguese sailors.

Another argument strengthening the hypothesis that the disease newly appeared in Europe in the fifteenth century was the severity of the disease. This is in accord with our knowledge that when a disease first appears among a people it rages with unwonted severity. The cases in Europe during the fifteenth century were characterized by the severity of the symptoms, and a fatal termination early in the course was not uncommon. Within fifty years syphilis rapidly diminished in severity and had already assumed the milder character with which we are familiar at the present time.

During and following the fifteenth century speculation was rife as to the source and cause of the disease. Indeed, it is only within the last thirty years that its American origin has been practically demonstrated. The evidence in favor of the fact that syphilis is of

American origin is convincing. The disease appeared suddenly in Europe after the return of Columbus. It was spread by Charles' army, among which were many Spanish adventurers. It was also recognized by all as a new disease. No evidences of syphilis have been found in pre-Columbian European or Oriental bones while pre-Columbian American bones show abundant traces of the disease. Apart from this circumstantial evidence, there is also much authentic documentary evidence to support the contention. Dias de Isla, a physician in practice in Lisbon in 1493, wrote a book on syphilis now in the National Library of Madrid. He states that syphilis was unknown before 1493, when it was imported by the crew of Columbus on his first voyage from Haiti. A majority of the crew were infected and Dias himself treated several syphilitic sailors from the crew. This document is supported by numerous others, and the evidence is convincing that syphilis was a new disease in Europe in the fifteenth century and that it was brought from Haiti by the sailors of Columbus returning from his first voyage to America.—*Abs., J. A. M. A.*, 1915.

Living Old and Well.

OLD AGE DISEASES REDUCE AVERAGE LENGTH OF LIFE.

During the nineteenth century the expectation of life rose to eight years or twice that of the two preceding years. This fact is accounted for chiefly through the saving of baby lives and the prevention of infectious diseases during early life. But for some reason the rate at present seems to be at a standstill, and a close study of conditions shows that the degenerate diseases after middle life, the nervous, heart and kidney diseases, are to blame. Furthermore the study shows that this is more evident in the United States than elsewhere.

The last census shows that the number of people in the United States dying from diseases of the blood vessels is nearly four times as great as it was ten years ago, which is to say we are living too fast and strenuously. Some one has said that the great broad fact seems to be that while we are freer of germs than our ancestors, our vital organs wear out sooner. We don't know the value of personal hygiene. We don't know our bodies. We haven't yet become interested in warding off diseases and living efficiently to a ripe old age.

An examination recently conducted by the Life Extension Institute is convincing proof of this statement. A physical examination of a large number of officials, clerks and other employes of banks and commercial houses, the average age being thirty years, showed that only 3% were normal and that over 90% did not know of their

approaching danger. Thirty-eight per cent were found with minor impairments with the early approach of disease while 51% had from moderate to serious impairments needing medical treatment or supervision. Eight per cent were seriously impaired and needed immediate medical attention.

It is seen that by periodic health examinations and intelligent personal hygiene many of the degenerate diseases may be headed off, and that man may easily and efficiently live out his allotted time of three score years and ten.—*North Carolina Press Bulletin*, 1915.

The Tuberculosis Nurse and Some of Her Problems.

A striking example of the principle that "man cannot live unto himself alone" is found in the home which has been invaded by tuberculosis. The knowledge of the fact that a member of the household has been stricken with this disease has a most depressing effect upon the family; and the changes in domestic arrangements and mode of living that its presence may necessitate are almost without number. That there are few households which can provide without actual sacrifice proper accommodations for a tuberculosis patient is self-evident.

When we consider that those conditions must be maintained not for days or weeks, but must be extended into months and probably years, we can have some slight realization of the problems which meet the nurse confronted with such a situation.

It is of prime importance that she establish friendly relations with the family, an achievement not always easy of accomplishment. The nurse who is called to care for a case of pneumonia or to look after the needs of the new born infant and its mother comes with something welcome and tangible to offer, and the tuberculosis nurse who is sent to the advanced case requesting bedside care needs no excuse for her presence. But when the patient is in the earlier stages of the disease, scarcely yet realizing that he is ill, a strange woman coming to the home armed with a roll of paper napkins and a somewhat burdensome list of instructions and gratuitous advice is not always met with open arms. Frequently the nurse is made to feel that she is suspected of some ulterior motive in her efforts. Unless she finds conditions so bad as to make immediate change imperative it is often wise to let the first visit to the family be purely social in its character.

The confidence of the family having been gained, the nurse can turn her attention to the correction of the evils which she is likely to find. If an actual lack of house room had made it necessary for the patient to share his room with one or more members of the family,

every effort should be made to get more commodious quarters. If it is impossible for the patient to have a room to himself the nurse should insist upon his having a separate bed as far away as possible from the other occupants of the room.

Although crowding and want of ventilation usually go hand in hand, it is not alone in the homes of the poor that the nurse must contend with a superstitious fear of "night-air". The process of educating a household to the need of fresh air is often long and difficult. Much, however, can be done to bring about the desired result by suggestions from the nurse as to the best way of securing an abundance of fresh air and at the same time of avoiding draughts. The house mother should be instructed also in bed-making so that a maximum amount of warmth may be secured with a minimum weight of bedding.

It takes the utmost tact to secure the co-operation of the patient in protecting other members of the family from infection. The sufferer is apt to be selfish and indifferent to the welfare of those about him, and he is often resentful of cautions to use his own towel and drinking cup and separate dishes. This sensitiveness may sometimes be overcome if he can be provided with linen and dishes a little better and more attractive than those used by the family. The carelessness of the average patient in the disposal of his sputum probably gives the tuberculosis nurse more anxiety than any other phase of the situation, and her only hope of securing any reformation in this matter lies in her ability to awaken in him a sense of responsibility to others.

There is the greatest difficulty in instructing patients to observe important precautions without inspiring an unreasoning fear in the minds of family and friends. The pathetic sight of a dying woman suffering for want of the drink of water that her terror-stricken husband dare not hand her is not soon to be forgotten.

The nurse should impress the necessity of a well-balanced diet not only for the patient but for the entire family in order to ward off future invasions of the disease. In this matter, however, racial and religious prejudices must be respected. The mere fact that a certain dish does not appeal to our American palate is not proof positive that it is unfit to eat. It is not unlikely that some of our own table delicacies seem quite impossible to our friends from across the water.

In well-to-do homes the drain of a long illness is often more than can be met by the family income, and in households where poverty already existed the situation soon becomes acute. If there is good reason for the patient's remaining in his home something must be done to ameliorate conditions. While the nurse does not as a rule dispense material relief she can put the family in touch with the

proper agencies and thus render valuable assistance. A private physician, ignorant of the straits to which the family has been reduced, when acquainted with the real state of affairs will usually render his services free of charge or give the case over to the City Physician.

Where living conditions are bad or where the patient is of the careless type his removal to an institution should be insisted upon. Frequently the very name of hospital raises a storm of protest. There is the natural dread of separation from friends, and rumors that those have gone to the hospital have died. But the situation becomes almost hopeless when some tradition of race or religion is the barrier which stands between the sufferer and the much-needed care.

Should the patient be removed to hospital or sanatorium, or should the case terminate in death, or reach a condition when the disease is apparently cured, the nurse's obligation to the family is by no means ended. She should insist upon each member of the family reporting at stated intervals either to a physician or to a dispensary that the first indication of an infection may be detected.

In no other branch of public health nursing is such demand made upon the resourcefulness and patience of the worker. Entering the home at a time when the family is perhaps benumbed by the first shock of the knowledge that disease in its most dreaded form has marked one of their circle, she must be able to make them feel that she comes in a friendly spirit of helpfulness to assist them in solving the problem of the readjustment of the household to meet the situation confronting it. She should be prepared to exercise forbearance towards the ignorant and the superstitious. But most of all does she need to carry about with her a spirit of courage and optimism, not losing heart because she may see little outward and visible result of her efforts, but happy in the confidence that the result will show in the generations to follow. — Abst. *Public Health Nurse Quarterly*, 1915.

Preventive Nursing — An Educational Bureau.

Preventive nursing is personified in the social service nurse, a hospital trained specialist peculiarly skilled in bringing to the medical examiner from the many persons in her care those who need his services, and in seeing his advice carried out until her services are superfluous. Preventive nursing is the common ground of modern medicine and modern philanthropy. Few modern hospitals, recognizing how many patients are diseased because they are impoverished, are now without a social service department. Few modern

philanthropic organizations, recognizing that more than half of their applicants are dependent because of sickness, are without a large and growing staff of nurses.

In two particulars, the Bureau of Educational Nursing is attempting to reach the ultimate standard of preventive nurses. First it recognizes that every hospital graduate is not naturally equipped for such work. She must have the medical examiner's sharp eye for physical and mental defects; she must possess infinite tact and tireless pertinacity; she must be capable of prompt and shrewd decisions and able to persuade, or even command, as well as to obey.

Without sacrificing field efficiency to statistical proficiency, the bureau has found that a complete system of records is both a barometer and an accelerator of that much-desired efficiency. Any essential fact in any case history is immediately accessible in simple and concise form. — Abst. *The Modern Hospital*, 1915.

The Function of the School Nurse.

The value of the school nurse is the one feature of medical inspection of schools about which there is no division of opinion. Her services have abundantly demonstrated her utility, and her employment has quite passed the experimental stage. The introduction of the trained nurse into the service of education has been rapid, and few school innovations have met with such widespread support and unqualified approval.

The reason for this is, that the school nurse supplies the motive force which makes medical inspection effective. The school physician's discovery of defects and diseases is of little use if the result is only the entering of the fact on the record card or the exclusion of the child from school. The notice sent to parents, telling of the child's condition and advising that the family physician be consulted, represents wasted effort if the parents fail to realize the import of the notification or if there be no family physician to consult. The nurse converts these ineffective lost motions into efficient functioning by assisting the physician in his examinations, personally following up the cases to insure remedial action, and educating teachers, children, and parents in practical applied hygiene.

The functions of the school nurse are most varied in different communities, and include duties which range from the reporting of cases of truancy to diagnosing contagious diseases — two extremes, neither of which properly falls within the purview of her work. In general, her duties may be summarized as follows:

- I. In the school:
 - (a) Making routine examinations of children to detect those cases which should be referred to the school physician.
 - (b) Assisting the physician in making physical examinations and recording results.
 - (c) Acting in emergency cases, such as caring for accidents, bandaging cuts, removing splinters, caring for cases of fainting, convulsions, and the like.
- II. In the home:
 - (a) Explaining to parents the significance of the notices sent by the school physician concerning the condition of their children, and aiding the parents in securing remedial action.
 - (b) Instructing and educating parents in the practices of applied hygiene.
- III. In the clinic:
 - (a) Assisting the physician in treatments and operations.
 - (b) Leading the children to view the proceedings of the clinic as diverting experiences rather than terrifying ordeals.

The history of school nursing shows its continual extension, and its increasing demands on the part of the workers. In a technical sense the work is not really nursing at all, but it calls for a skill and knowledge acquired only in the training schools for nurses, and demands qualifications which can be secured only in the school of experience.

As an example of the value of the school nurse's work in reducing the number of exclusions on account of contagious and infectious diseases, it was the experience of New York City between the years of 1902 and 1911 that, through the employment of school nurses, exclusions from school had been reduced to something like one-thirtieth of their former proportions. A set of data presented by Dr. Newmayer of Philadelphia, shows the number and per cent. of recommendations acted upon in four schools where the medical inspector was unaided by a nurse. The comparison shows that with the aid of the school nurse eighty-nine per cent. of recommendations were acted upon by the parents, and with the school physicians without the aid of the school nurse, there were only twenty-four per cent. of recommendations acted upon.

The school nurse is the teacher of the parents, the pupils, the teachers, and the family in applied practical hygiene. Her work prevents loss of time on the part of the pupils and vastly reduces the number of exclusions for contagious diseases. She cures minor ailments in the school and clinic, and furnishes efficient aid in emergencies. In the home, she gives practical demonstrations of required treatments, often discovering there the source of the trouble, which, if not discovered, would render useless the work of the medical

inspector in the school. The school nurse is the most efficient possible link between the school and the home. Her work is immensely important in its direct results, and far-reaching in its indirect influences. Among foreign populations, she is a very potent force for Americanization. — Abst. *The Modern Hospital*, 1915.

A Plea for Efficiency and Economy in the Maintenance and Operation of the Private Agencies Working for the Conservation and Promotion of Public Health.

Public health is nothing more than the aggregate of the health of the individuals of which the public is made up, and the protection and promotion of the public health is merely the protection and promotion of the health of the individual. Up to a certain point, each individual can protect himself, but beyond this he cannot go, and we have not yet arrived at that happy state in which the government does everything that logically and equitably it should do, and in no other field of human welfare is the inadequacy of the discharge of government functions so marked as in the field of public health. Until the government does recognize its obligations and undertakes to discharge them, organized private effort will be necessary.

Since there is no public health separate and distinct from the aggregate of the private health of the community, the organization that would better public health in any respect whatsoever must reach the individual and induce him to act; it may be to induce him to protect his own health or to protect the health of his neighbors, or it may be to induce him to raise his voice to compel the government to give to the protection and promotion of the health of the people the same interest and support that it gives to merely material things.

The difficulty of bringing home to the individual the facts we know concerning personal hygiene, stands as much in the way of the prevention of tuberculosis as in the way of the prevention of social diseases. Inducing the public to protect the water supplies shows the same problems as interesting the public in an active way in school hygiene. "Do not spit in public places" is as good advice for the prevention of diphtheria as for the prevention of tuberculosis. Tuberculosis has no patent upon the need of life in the open air, for such life undoubtedly conduces to the prevention of pneumonia as well as to the prevention of the white plague itself. Prevention of infant mortality aims to limit all conditions inimical to infant life, and these are the same conditions inimical to all life. Organizations should

join in an effort to standardize their methods of work, so that each may have the benefit of the knowledge and experience of all others.

That co-ordination of the work of our public health agencies would be productive of results better than are now attained seems certain. The organization and work of any volunteer private agency engaged in work looking toward the conservation and promotion of public health involve several distinct activities: First, appeals for money and volunteer services. Second, the organization, supervision, and control of the working forces of the association. Third, the rendering of service to the public, for which the association or society exists.

The argument most frequently advanced in favor of the maintenance of a number of special societies is that certain individuals can be reached by appeals on behalf of one form of public health work, who have no interest in any other; and that special societies can best reach such individuals. By any proper system of accounts, or by a system of trust funds, any organization can assure the donor that what is given for a particular purpose will be applied to no other. Moreover, while the appeal of the special society must be based upon interest in some particular disease, the general appeal of the general society can be based upon other interests that may be even stronger. This society can appeal to state, county, city or town, to the members of any religious organization or fraternal order.

One of the most serious obstacles to the success of the special society lies in the very matter of administration and administrative expenses. The work of the central office absorbs so much of the money and energy of the organization that field work is practically impossible, and overhead charges out of all proportion to the work accomplished.

If the work of all the special societies were organized and supervised under the direction and control of a central body, one office, one secretary, one group of office assistants, and one budget for all incidental expenses might be relied upon to serve the entire organization. With better organization of the central office which larger resources would permit, with a capable field corps to maintain a propaganda for health throughout the county, and with an aggressive official journal, supplemented it may be with a popular health magazine, the future of any organization would be secure.

The larger general society with the corresponding increase in its resources that would come with increased size would tend to draw the sympathy and support of all specialists and scientific workers in the field of public health. It would permit the better separation of

the purely administrative work of the organization from the scientific and practical work. For the administrative work is almost always distasteful to the scientist and can be better done by persons trained for such details.

In order to accomplish its ends, each special society must get in touch with persons who are specially needing its particular service, and in order to do so it must scour the whole population. And as the discards of one society are never referred to any other, the result is a large number of agencies scouring the entire territory in a very ineffective way, instead of one effectively searching, with a proper sorting and arranging of the results. A broader appeal would reach persons not yet diseased, but interested in the problems of maintaining good health generally; in the problem of preventing disease, not merely of preventing a disease.

It seems clear that the consolidation of all of the organizations now active in public health work into one organization would result in such efficiency and economy in the execution of such work as is not possible under existing conditions. In the eyes of the law and in conscience, the execution of public health work, even though voluntarily undertaken, is a business, and the money collected for its execution is a trust fund which every contributor has a right to see economically expended for the purpose for which given, and duly accounted for. Clearly, then, it is our duty to labor toward the end that the private agencies now engaged in the conservation and promotion of public health be consolidated into one well-organized, efficient, and economical body. — Abst. *American Journal of Public Health*, 1915.

THE PRACTICING PHYSICIAN.

His Relation to Public Health Administration.

A principal function of the Federal health department is the control of epidemics and the prevention of the spread of disease from one state to another. It is impossible for the National Government to prevent the spread of these diseases unless it knows where they are present. This information can be obtained only from the practicing physician.

The work of health departments is to control controllable diseases, and this work is impossible without first having information as to whether the disease is present in the community and if present, how prevalent and where, and under what conditions cases are

occurring. The burning of punk in the streets, or the placing of mystic symbols over the doorway, or the mere appointment of a health officer, and the appropriation of money will not protect against disease. The community is helpless to control either communicable or occupational disease in the absence of definite knowledge of the conditions under which cases are occurring, and a health department which does not know of the prevalence of disease within its jurisdiction, is a health department in name only.

As a rule, the heads of health departments have been physicians, for, on account of their training, they are the ones most capable of recognizing disease, methods of spread, and the means of control. At the present time, the courses given by even our best medical schools furnish to the student but little opportunity to acquire but the most superficial knowledge of the prevention and control of disease in its relation to the community. To so great an extent has this been true that it is quite probable that the advances made in public health administration in this country have been due as much to the demands of social workers for efficient health officers as to any influence which medical practitioners may have had. The action taken during the last few years by a number of the largest medical schools in providing courses in preventive medicine for health officers, has been in response as much to the demands of social workers and other non-medical persons as to any influence which has come from the medical practitioner.

In a way the social worker can properly be expected to be more interested in the establishment of efficient health departments than is the physician. The doctor encounters disease in detail. He sees one case at a time. His thought and attention are focused on getting his patient well, and the significance of the occurrence of a case of disease as it relates to the community in general seldom appeals to him.

The business of the social worker and public health worker is the bettering of the conditions under which man lives. To them the misery and sorrow caused by disease, the bearing of disease on poverty and of poverty on disease, are apparent. Sickness caused by faulty industrial conditions is being constantly brought to their attention.

The practicing physician is essentially a part of the health department, whether he recognizes it or not, and whether the community recognizes it or not. He is the outpost, the picket that must give information of the approach of the enemy, his numerical strength, and his armament.

The doctor who fails to report a case of a communicable disease thereby endangers the welfare of the community. He is neither a good physician nor a good citizen. With the help and co-operation of the practicing physician the health department can do much to prove the truth of Pasteur's statement that it is within the power of man to cause all infectious diseases to disappear. — Abst. *Public Health Reports*, 1915.

Truth in Publicity.

Publicity is a great factor in the education of the public and is employed by various concerns for different purposes, from industrial concerns for general advertising to health boards and organizations for the dissemination of public health truths.

But as in all education it is essential that only the truth be taught, so in public health work it is especially important that only such information as will bear critical examination be spread abroad.

In the past, much was taught as science which was not science, and these errors persist to the present day and hinder progress. Examples are the notions, once widely held, that soil was a common source of disease; that foul emanations from decomposing organic matter were sucked up from cellars by the warm air of the house and carried sickness and death; that cemeteries endangered water in wells even a half-mile distant, the decomposing bodies being thought to pollute the air, the ground, and the percolating waters.

The belief that filth was the principal source of disease persisted until after the Spanish War. Colonel Waring was sent to clean up Havana and exterminate yellow fever. He cleaned up the city, but the fever was more virulent than ever.

Air was the chief vehicle of infection or even the infection itself, hence the fear of fomites and the worship of disinfection. Typhoid fever was frequently attributed to damp, uncleanly cellars.

The harm that results from the spread of false information is shown in the case of vaccination against smallpox. The discovery was a fine piece of scientific work, but it was marred by the false assumption that when performed in childhood the immunity lasted through life. This was afterward found to be untrue, but the mistake served more than anything else to develop and keep alive the anti-vaccination propaganda.

Jenner proved the protective power of vaccination, a truth which will always stand. It remained for others to determine how universal is this immunity and how long it persists, and countless other sec-

ondary truths of great importance, which have been and are being added to the original truth. It was only the hasty assumption of the philanthropist which had to be unlearned.

In our own time, the amateur sanitarian and the social reformer, and even the public health official, are impatient of the slow progress of science, and taking the short and easy road which is paved with guess-work, theories, and unfounded assumptions, they hasten to spread error before the people, which will later hamper the health officer as does now the assumption as to the duration of vaccinia immunity or the theory of air-borne infection.

Error prevails today. The old heresy about the all-importance of any kind or all kinds of dirt, in the causation of disease, still persists. To fight all kinds of dirt instead of limiting attacks to dangerous dirt is misleading and futile. Such statements as "The dirt-rate of a city is a big factor in determining its death rate" and "A vigorous anti-dirt campaign would do the city more good than any other kind of an 'anti' campaign of which we are able to conceive—more good morally, physically, healthfully, and eventually with respect to its reputation;" and "To clean up the city means to clean out disease" leads the public to believe that when the streets are swept, the rubbish removed from the cellar and yard, the garbage cremated instead of dumped, and the spring housecleaning done, the city's death-rate will be lowered. When they find it is not, they will not believe the next issue of the bulletin, which tells them that anti-toxin cures diphtheria.

Another form of dirt which appeals to the publicity man is dust. Sharp mineral dust is dangerous. But it is the dust of the street and the home that is attacked in the monthly bulletin. There is no evidence to show that the dust of the street falling on fruit, candy and ice cream has produced disease. But under this campaign of publicity, some communities which feel too poor to furnish free anti-toxin are spending money to keep dust off the ice cream and bananas.

Fallacies regarding the danger of re-breathing air in crowded rooms, the harm in adulterated foods and the benefits from flyswatting campaigns have also been over-emphasized.

One great trouble with the publicity man is an inordinate desire to get in on the ground floor. When he hears something new, he tells it without waiting to learn if it is true. Some publications may be scoured in vain for errors, while others offend in every issue.

Scientific accuracy should be insisted on. One can hold steadfast to scientific truth and yet avoid all pedantry and scientific jargon.

Finally, there are plenty of old truths which all of our 100,000,000 people have not yet learned. — *Abst. Am. Jour. of P. H.*, 1915.

Health Workers Must Take Their Own Medicine.

"Practice what you preach" is another one of those homely bits of advice that we are always running up against. This particular one is handed out to public health workers almost as frequently as it is to preachers themselves, and not without grounds, we'll have to admit. For instance, the other day, "Pat," the famous anti-typhoid cartoonist whose clever work has been attracting attention through numerous papers of the State and whose advice through his cartoons has been inducing scores of people to take the anti-typhoid treatment as a preventive of typhoid fever, wrote to the State Board of Health, this: "I have been knocked out for the past week and am still indisposed. Doc says 'fever;' probably so. It's antitoxin for me soon as I get able. Really had planned to start taking it just when I got knocked out."

We ourselves could hardly forego the pleasure of advising him to first practice what he preached but we thought he was learning the lesson well enough first hand.

Another instance in which the same advice was recently sent straight home was in the case of one of the doctors at one of the anti-typhoid dispensaries. A young fellow who wanted to be sure he was making no mistake in taking the vaccine treatment questioned carefully one after another of those assisting and administering the vaccine as to whether or not they had taken it. Finally, the young fellow came to the doctor who was giving the injections and when he so sternly put the question up to him, the doctor, who we regret had never taken the treatment, was nonplused. Now Nature had dealt very sparingly with this particular doctor in the matter of superfluous flesh and by reason of hot weather and overwork he became still more emaciated. To sidestep the question, he wriggled out only by saying that he had so little flesh on his bones that he doubted if there could be found a spot big enough in which to make the injection and that it would not do to put it in the bone. The boy looked the doctor over and sympathetically walked away. Whether he thought the doctor was so devoid of flesh as not to be worth saving from typhoid, we never learned. Not long after, however, the doctor, too, took the hint and followed his own advice. — *North Carolina Press Bulletin*, 1915.

REPORT OF THE HYGIENIC LABORATORIES, OHIO STATE BOARD OF HEALTH, FOR THE MONTH ENDING JULY 31, 1915.

Diphtheria: Positive 54, negative 233, sus. 17.....	304
Tuberculosis: Positive 108, negative 195.....	308
Typhoid: Positive 12, negative 81, atyp. 19.....	112
Rabies: Positive 15, negative 4, unsat. 6.....	25
Malaria: Negative 2.....	2
Miscellaneous	4
Water, chemical	40
Water, bacteriological	259
Sewage: Chemical 2, bacteriological 2.....	4

Total number of examinations1,053

REPORTED CASES OF NOTIFIABLE COMMUNICABLE DISEASES, JULY, 1915.

	<i>Cities.</i>	<i>Townships and Villages.</i>	<i>Total.</i>
Tuberculosis (all forms).....	466	71	537
Pneumonia	78	13	91
Typhoid fever	187	133	320
Diphtheria	260	68	328
Whooping cough	656	389	1,045
Measles	933	424	1,357
Scarlet fever	145	74	219
Chickenpox	105	61	166
Smallpox	59	72	131
Mumps	60	120	180
Gonorrhea	107	79	186
Syphilis	81	16	97
German measles	14	9	23
Epidemic Cerebro-spinal Meningitis.....	6	4	10
Acute Anterior Poliomyelitis.....	31	5	36
Ophthalmia Neonatorum	83	5	88
Trachoma	13	4	17
Tetanus	3	1	4
Malaria	3	1	4
Paratyphoid fever .....	...	2	2
Rabies	1	....	1
Dysentery .....	...	2	2
Total	3,291	1,553	4,844

COMMUNICABLE DISEASES, JULY 1915.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
ADAMS COUNTY—										
Manchester	Vil.		1	1						
Peebles	Vil.				5					
Seaman	Vil.		1							
West Union	Vil.		1							
Jefferson	Tp.			3						
Liberty	Tp.					4				
Monroe	Tp.	1								
Sprigg	Tp.		1							
Wayne	Tp.					1				
ALLEN COUNTY—										
Delphos					1	1		4		
Lima	1		3		17		10			1
Beaverdam	Vil.	1								1
Bluffton	Vil.	1								
Lafayette	Vil.	1					1			2
West Cairo	Vil.				1					
Marion	Tp.					2				
ASHLAND COUNTY—										
Ashland	1		1							
Loudonville	Vil.			1						
Perrysville	Vil.					1				
Savannah	Vil.							1		
Mohican	Tp.						1			
Troy	Tp.				5					
ASHTABULA COUNTY—										
Ashtabula	1			1						
Andover	Vil.					4				
Jefferson	Vil.				1	1				
Andover	Tp.					3				
Austinburg	Tp.	1								
Conneaut	Tp.		1							
Harpersfield	Tp.	1								
Jefferson	Tp.					1				
Kingsville	Tp.		2							
Monroe	Tp.				2					
New Lyme	Tp.									1
Rome	Tp.	1								
Williamsfield	Tp.					3				
ATHENS COUNTY—										
Athens			1							
Nelsonville	1			1						
Buchtel	Vil.		1	1	4					
Coolville	Vil.			1		1				
Canaan	Tp.		1							
York	Tp.	1								
AUGLAIZE COUNTY—										
New Bremen	Vil.							3		
Pusheta	Tp.							2		
Wayne	Tp.	1								
BELMONT COUNTY—										
Bellaire			3			9				
Martins Ferry	1									
Barnesville	Vil.	1	1		9					
Belmont	Vil.		1			1				
Brookside	Vil.			1			3			
Flushing	Vil.	1						1		
Shadyside	Vil.	1								
Flushing	Tp.					1				
Pease	Tp.		1				5			
Pulney	Tp.		1							
Warren	Tp.			3						
Washington	Tp.				6					
Wayne	Tp.					1		2		

COMMUNICABLE DISEASES, JULY 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
BROWN COUNTY—										
Ripley	Vil.	1								
Clark	Tp.					1				
Huntington	Tp.				2					
Sterling	Tp.							2		
Union	Tp.	1								
BUTLER COUNTY—										
Hamilton		1	4	1	2	5		2		
Middletown			1		4	10	1			
Somerville	Vil.	1								
Ross	Tp.				3					
CARROLL COUNTY—										
Lee	Tp.							1		
CHAMPAIGN COUNTY—										
Urbana			1		1					
St. Paris	Vil.				1					
Goshen	Tp.				7					
Wayne	Tp.				3	1				1
Union	Tp.									2
CLARK COUNTY—										
Springfield		12	1	6	3	1	1	7		12
New Carlisle	Vil.		1	2	2					
Bethel	Tp.									
Pleasant	Tp.				2					1
Springfield	Tp.			2				1		
CLERMONT COUNTY—										
Bethel	Vil.					1				
Loveland	Vil.							4		
Milford	Vil.					1				
New Richmond	Vil.		2		2	8				
Goshen	Tp.			1			1			
Stonelick	Tp.					1				
Union	Tp.			1						
Wayne	Tp.				5					
CLINTON COUNTY—										
Sabina	Vil.			1						
Wilmington	Vil.		1							
Chester	Tp.									2
Union	Tp.									1
Wayne	Tp.				1					
COLUMBIANA COUNTY—										
East Liverpool				3			2		5	
Salem			2	2						
Wellsville			4				1	1		
Columbiana	Vil.						1			
East Palestine	Vil.		2				1			
Leetonia	Vil.						1			
Lisbon	Vil.			2			1			
Salineville	Vil.						1			
St. Clair	Tp.			1						
Fairfield	Tp.						1			
Hanover	Tp.				3					
Knox	Tp.				4					
Liverpool	Tp.								1	
Middleton	Tp.	1								
Perry	Tp.						2			
COSHOCTON COUNTY—										
Coshocton				4						
New Castle	Tp.					1				
CRAWFORD COUNTY—										
Bucyrus			1					2		
Galion						5				
Crestline	Vil.			1		15				

COMMUNICABLE DISEASES, JULY 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
CRAWFORD COUNTY—Concluded.										
New Washington	<i>Vil.</i>					5				
Tiro	<i>Vil.</i>					3				
Auburn	<i>Tp.</i>			1			1			
CUYAHOGA COUNTY—										
Cleveland	153	58	33	100	192	386	36	38	2	14
East Cleveland				4	22	4				
Lakewood	1									
Bratenahl	<i>Vil.</i>					2				
Chagrin Falls	<i>Vil.</i>					1				
Cleveland Heights	<i>Vil.</i>				2	4		3		
Linddale	<i>Vil.</i>						1			
North Olmstead	<i>Vil.</i>						1			
Olmstead Falls	<i>Vil.</i>					1				
South Newburgh	<i>Vil.</i>					1				
Brook Park	<i>Vil.</i>			1						
Bedford	<i>Tp.</i>									
Brecksville	<i>Tp.</i>					4				
Mayfield	<i>Tp.</i>					1		1		
Royalton	<i>Tp.</i>					12				
DARKE COUNTY—										
Greenville	1									
Ansonia	<i>Vil.</i>		1			1				
Arcanum	<i>Vil.</i>				2					
Union City	<i>Vil.</i>				1	1				1
Versailles	<i>Vil.</i>						1			
Adams	<i>Tp.</i>						1			
Brown	<i>Tp.</i>		1							
Greenville	<i>Tp.</i>						1			
Neave	<i>Tp.</i>						1			
DEFIANCE COUNTY—										
Defiance	1			1			2			
Hicksville	<i>Vil.</i>		1							
Noble	<i>Tp.</i>							1		
DELAWARE COUNTY—										
Delaware						1	9			1
Berlin	<i>Tp.</i>				8	17				
Delaware	<i>Tp.</i>						2			
Genoa	<i>Tp.</i>						1			
Radnor						2				
Thompson	<i>Tp.</i>							1		
ERIE COUNTY—										
Sandusky	4	2	2	2		29		3		2
Berlin Heights	<i>Vil.</i>		1							
Huron	<i>Vil.</i>						1			
Vermilion	<i>Vil.</i>					2				
Groton	<i>Tp.</i>					1				
Huron	<i>Tp.</i>		1							
Margaretta	<i>Tp.</i>					1				
FAIRFIELD COUNTY—										
Lancaster				2						
Bremen	<i>Vil.</i>	1								
Pleasantville	<i>Vil.</i>		1							
Liberty	<i>Tp.</i>					4				
Pleasant	<i>Tp.</i>					1				
Rush Creek	<i>Tp.</i>		1							
Walnut	<i>Tp.</i>				1					
FAYETTE COUNTY—										
Green	<i>Tp.</i>		1							
Jasper	<i>Tp.</i>	1								
Jefferson	<i>Tp.</i>									1
FRANKLIN COUNTY—										
Columbus	34		10	7	24	22	6	8		
Hanford	<i>Vil.</i>						2			
Linden Heights	<i>Vil.</i>	1								

COMMUNICABLE DISEASES, JULY 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
FRANKLIN COUNTY—Concluded.										
Westerville	Vil.				10					
Franklin	Tp.	3		2						
Hamilton	Tp.				2					
Jefferson	Tp.		3							
Madison	Tp.				2	5				
Norwich	Tp.			3						
Prairie	Tp.			1						
FULTON COUNTY—										
Delta	Vil.					1				
Fayette	Vil.				30	1				
Wauseon	Vil.				8					
Amboy	Tp.					2				
GALLIA COUNTY—										
Gallipolis						1				
Cheshire	Tp.					7				
Gallipolis	Tp.	1	1			2				
GEAUGA COUNTY—										
Chardon	Vil.		1		1					
Bainbridge	Tp.					1				
Russell	Tp.					1				
GREENE COUNTY—										
Xenia						1				2
Spring Valley	Vil.				2					
New Jasper	Tp.				5					
Spring Valley	Tp.		1		2					
GUERNSEY COUNTY—										
Cambridge		5	7	1	2		1			
Lore City	Vil.		1		5					
Senecaville	Vil.	1								
Adams	Tp.	1								
Cambridge	Tp.			1						
Center	Tp.		1							
Richland	Tp.	1								
Spencer	Tp.								1	
HAMILTON COUNTY—										
Cincinnati		113	13	53	31	197	9	8	4	7
Norwood		3	1	3		1	1		1	
Cleves	Vil.			1						
Glendale	Vil.	1								
Lockland	Vil.					1				1
Wyoming	Vil.									1
Green	Tp.		1		2					
HANCOCK COUNTY—										
Findlay				2		6				
Amanda	Tp.									1
Delaware	Tp.				1			1		
Liberty	Tp.						1			
HARDIN COUNTY—										
Forest	Vil.		1			4				
Mt. Victory	Vil.					1	2			
Ridgeway	Vil.	1								
Liberty	Tp.	1			2	2				
McDonald	Tp.		1	1						
HARRISON COUNTY—										
Cadiz	Vil.				1					
Hopedale	Vil.				4					
Jewett	Vil.					2				4
Cadiz	Tp.		2		4					
HENRY COUNTY—										
Holgate	Vil.		1							
Damascus	Tp.	1								
Flat Rock	Tp.		1							

COMMUNICABLE DISEASES, JULY 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
HENRY COUNTY—Concluded.										
Marion	<i>Tp.</i>								1	
Napoleon	<i>Tp.</i>			1						
Pleasant	<i>Tp.</i>						1			
HIGHLAND COUNTY—										
Greenfield	<i>Vil.</i>		1							
Paint	<i>Tp.</i>		1							
HOCKING COUNTY—										
Benton	<i>Tp.</i>		1							
Falls	<i>Tp.</i>						1			
Ward	<i>Tp.</i>								10	
HOLMES COUNTY—										
Hardy	<i>Tp.</i>						1			
HURON COUNTY—										
Bellevue					13	31				
Norwalk	1									1
Greenwich									3	
New London			1							
Clarksfield	<i>Tp.</i>		1							
Greenwich	<i>Tp.</i>							3		
Peru	<i>Tp.</i>					4				
Townsend	<i>Tp.</i>				2		2			
Wakeman	<i>Tp.</i>		1							
JACKSON COUNTY—										
Wellston			1							
Oak Hill	<i>Vil.</i>		1							
Milton	<i>Tp.</i>		8							
JEFFERSON COUNTY—										
Steubenville			3	3			5			
Toronto	<i>Vil.</i>		2							
Cross Creek	<i>Tp.</i>		1							
Salem	<i>Tp.</i>						1			
Springfield	<i>Tp.</i>						1			
Wayne	<i>Tp.</i>			2						
Wells	<i>Tp.</i>		1							
KNOX COUNTY—										
Mt. Vernon						10	5			
Pike	<i>Tp.</i>		1							
Pleasant	<i>Tp.</i>					6				
Union	<i>Tp.</i>				4					5
LAKE COUNTY—										
Madison	<i>Tp.</i>			1						
Perry	<i>Tp.</i>					1				
LAWRENCE COUNTY—										
Ironton				1		1				
Proctorville	<i>Vil.</i>		2							
Mason	<i>Tp.</i>			1						
Union	<i>Tp.</i>					3				
LICKING COUNTY—										
Newark		3	1	1		72				
St. Louisville	<i>Vil.</i>							1		
Utica	<i>Vil.</i>		1			2				
Bennington	<i>Tp.</i>	1			6					1
Burlington	<i>Tp.</i>	1								
Eden	<i>Tp.</i>					10				
Fallsburg	<i>Tp.</i>					1				
Granville	<i>Tp.</i>					4				
Hanover	<i>Tp.</i>		1		4	9				
Lima	<i>Tp.</i>		1			8				4
Madison	<i>Tp.</i>	2			4	3				5
Mary Ann	<i>Tp.</i>		2		3	8				1

COMMUNICABLE DISEASES, JULY 1915—Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
LOGAN COUNTY—										
Bellefontaine			3		11			1		
Rushsylvania	<i>Vil.</i>		1							
Zanesfield	<i>Vil.</i>						2			
Harrison	<i>Tp.</i>									
Lake	<i>Tp.</i>				3					
McArthur	<i>Tp.</i>		1					1		
LORAIN COUNTY—										
Elyria				1		4	2		12	
Lorain	3			1	7	9		1		
Grafton	<i>Vil.</i>								1	
Oberlin	<i>Vil.</i>	1		1		8				2
Amherst	<i>Tp.</i>				1					3
Avon Lake	<i>Tp.</i>	1								
Carlisle	<i>Tp.</i>								8	
Columbia	<i>Tp.</i>	1								
Grafton	<i>Tp.</i>				5				3	
Huntington	<i>Tp.</i>					1				
LUCAS COUNTY—										
Toledo	67		56	12	166	61	5	14	1	2
Waterville	<i>Vil.</i>						2			
Jerusalem	<i>Tp.</i>				2					
Washington	<i>Tp.</i>		3		3	1	2			
MADISON COUNTY—										
London	<i>Vil.</i>						1			
South Solon	<i>Vil.</i>									1
Canaan	<i>Tp.</i>		1							
Fairfield	<i>Tp.</i>		1							
Pike	<i>Tp.</i>				4					
Somerford	<i>Tp.</i>						1			
MAHONING COUNTY—										
Youngstown	20	7	3	9	97	20	7	1	10	9
East Youngstown	<i>Vil.</i>	1	1	3	1					
Poland	<i>Vil.</i>				6	1				4
Struthers	<i>Vil.</i>		2					1		1
Austintown	<i>Tp.</i>									2
Berlin	<i>Tp.</i>		1							
Boardman	<i>Tp.</i>				10					6
Coitsville	<i>Tp.</i>	1				1			1	
Ellsworth	<i>Tp.</i>					1				
Poland	<i>Tp.</i>					2				1
MARION COUNTY—										
Marion			3	1						
Caledonia	<i>Vil.</i>					2				
Bowling Green	<i>Tp.</i>								3	
Marion	<i>Tp.</i>		4							
Montgomery	<i>Tp.</i>					1				
Pleasant	<i>Tp.</i>					1				
Prospect	<i>Tp.</i>							2		
Waldo	<i>Tp.</i>		1	1						
MEDINA COUNTY—										
Leroy	<i>Vil.</i>								1	
Wadsworth	<i>Vil.</i>		1			5				
Brunswick	<i>Tp.</i>					2				
Guilford	<i>Tp.</i>							1		
MEIGS COUNTY—										
Middleport	<i>Vil.</i>					3				
Racine	<i>Vil.</i>	1								
Bedford	<i>Tp.</i>					5				
Chester	<i>Tp.</i>					10				
Rutland	<i>Tp.</i>					4				
Salisbury	<i>Tp.</i>					2				
Sutton	<i>Tp.</i>					27				

COMMUNICABLE DISEASES, JULY 1915—Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MERCER COUNTY—										
Celina	Vil.					1	2			
Coldwater	Vil.								1	
Rockford	Vil.				4	4			2	
Liberty	Tp.					25				
Marion	Tp.		1							
Union	Tp.		2							
Washington	Tp.				1					
MIAMI COUNTY—										
Piqua		2		1	3	1				
Casstown	Vil.									1
Covington	Vil.	1								1
Laura	Vil.				1					
Pleasant Hill	Vil.	1	4							
West Milton	Vil.		1							
Bethel	Tp.				6					
Lost Creek	Tp.									1
Newton	Tp.						2	1		
Union	Tp.							1		
Washington	Tp.						1			
MONROE COUNTY—										
Beallsville	Vil.	1								
Clarington	Vil.		1							
Woodfield	Vil.			1						
Ohio	Tp.	1								
Summit	Tp.			2						
MONTGOMERY COUNTY—										
Dayton		22	2	6	1	44	2	17	7	6
Miamisburg	Vil.								1	
Phillipsburg	Vil.			1	3					
Harrison	Tp.		1							
Madison	Tp.						1			
Perry	Tp.	1			4					
Washington	Tp.	1								
MORGAN COUNTY—										
Bloom	Tp.				2					
MORROW COUNTY—										
Mt. Gilead	Vil.				2					
Franklin	Tp.	1								
Peru	Tp.					7				
Westfield	Tp.			1						
MUSKINGUM COUNTY—										
Zanesville			1		1	4	1	1		1
Frazesburg	Vil.	1								1
Cass	Tp.				1					
Madison	Tp.				2					
Meigs	Tp.		3							
Perry	Tp.				2					
Washington	Tp.									1
Wayne	Tp.									3
NOBLE COUNTY—										
Sarahsville	Vil.				10			5		
Brookfield	Tp.		4							
Center	Tp.				30					
Jefferson	Tp.				3					
Marion	Tp.				4					
OTTAWA COUNTY—										
Port Clinton	Vil.	2								
Bay	Tp.	1								
Carroll	Tp.	1								
Catawba Island	Tp.							1		
Danbury	Tp.									2
Portage	Tp.					1				

COMMUNICABLE DISEASES, JULY 1915—Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
PAULDING COUNTY—										
Paulding	Vil.			1						
Benton	Tp.		1							
Blue Creek	Tp.		1							
Brown	Tp.								2	
Emerald	Tp.								1	1
Jackson	Tp.								1	
PERRY COUNTY—										
Corning	Vil.	1								
New Straitsville	Vil.								7	
Rendville	Vil.				3					
Thornville	Vil.				18					
Santoy	Vil.				18	4				
Coal	Tp.					3			2	
Jackson	Tp.	4			3					
Monday Creek	Tp.					3			7	
Monroe	Tp.					2				
Pike	Tp.						1			
Thorn	Tp.				12	1				
PICKAWAY COUNTY—										
Circleville						19				
Darby	Tp.					3	1			
Harrison	Tp.			1						
Scioto	Tp.		2							
PIKE COUNTY—										
Pebble	Tp.							2		2
Sunfish	Tp.							6		
PORTAGE COUNTY—										
Ravenna				1						
Garrettsville	Vil.					1				
Franklin	Tp.						1			
Freedom	Tp.			1						
Nelson	Tp.					4				
Ravenna	Tp.					5				
PREBLE COUNTY—										
Eaton	Vil.	1		1						
New Paris	Vil.		1							
West Elkton	Vil.				10					
Lanier	Tp.			1						
Washington	Tp.		2							
PUTNAM COUNTY—										
Pandora	Vil.		2							
West Leipsic	Vil.					4				
Blanchard	Tp.	1								
Pleasant	Tp.		1							
Riley	Tp.		1							
RICHLAND COUNTY—										
Mansfield			1	1			1	5		
Lexington	Vil.					2				
Shelby	Vil.	1								
Cass	Tp.					3				
Madison	Tp.			1						
Springfield	Tp.					4				
ROSS COUNTY—										
Chillicothe		4	1	3						
Frankfort	Vil.					1				
Green	Tp.			1						
Paint	Tp.									1
SANDUSKY COUNTY—										
Fremont		3	1	1	6		1			
Clyde	Vil.					4				
Woodville	Vil.		1			3				
Washington	Tp.								1	
York	Tp.					1		1		

COMMUNICABLE DISEASES, JULY 1915 — Continued.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
SCIOTO COUNTY—										
Jefferson	<i>Tp.</i>			1						
Nile	<i>Tp.</i>									7
Porter	<i>Tp.</i>			1						
Washington	<i>Tp.</i>			4						
SENECA COUNTY—										
Fostoria			1	1					16	
Tiffin			1	4	12	8				
Adams	<i>Tp.</i>	1								
Pleasant	<i>Tp.</i>					1				
Thompson	<i>Tp.</i>					2				
Venice	<i>Tp.</i>									2
SHELBY COUNTY—										
Sidney									1	
Dinsmore	<i>Tp.</i>								1	
Washington	<i>Tp.</i>				5					
STARK COUNTY—										
Canton	2		2	7	1	10	12		4	1
Massillon				3						
Limaville	<i>Vil.</i>					1				
Navarre	<i>Vil.</i>		3			1				
Sugar Creek	<i>Tp.</i>					4				
SUMMIT COUNTY—										
Akron	2		6	9		7	7	1	8	
Barberton	1	1	1	1			3			
Cuyahoga Falls	<i>Vil.</i>		1	1				3		1
Northfield	<i>Vil.</i>		1							
Copley	<i>Tp.</i>								2	
Portage	<i>Tp.</i>			1					2	
Twinsburg	<i>Tp.</i>				1	2				
TRUMBULL COUNTY—										
Niles	2	2								
Warren	1									
Mineral Ridge	<i>Vil.</i>	1	1	2						
Bazetta	<i>Tp.</i>									3
Braceville	<i>Tp.</i>		3		8	13				
Champion	<i>Tp.</i>					4				
Hubbard	<i>Tp.</i>	1								
Southington	<i>Tp.</i>		1							
Vienna	<i>Tp.</i>					7				
TUSCARAWAS COUNTY—										
Canal Dover								1		
New Philadelphia										1
Bolivar	<i>Vil.</i>				1					
Dennison	<i>Vil.</i>									1
Newcomerstown	<i>Vil.</i>						1			
Shanesville	<i>Vil.</i>									
Sugar Creek	<i>Vil.</i>					4			4	
Uhrichsville	<i>Vil.</i>			2			2			
Zoar	<i>Vil.</i>				5					
Franklin	<i>Tp.</i>		1	1		1				
Lawrence	<i>Tp.</i>		2							
Mill	<i>Tp.</i>			1						
Oxford	<i>Tp.</i>						8			
Sandy	<i>Tp.</i>				2					
Warwick	<i>Tp.</i>				3					
UNION COUNTY—										
Leesburg	<i>Tp.</i>						1			
VAN WERT COUNTY—										
Van Wert			1							
Convoy	<i>Vil.</i>		1				1			
Harrison	<i>Tp.</i>					1				3
VINTON COUNTY—										
Elk	<i>Tp.</i>			1						
Swan	<i>Tp.</i>					1				

COMMUNICABLE DISEASES, JULY 1915 — Concluded.

This table records cases of specified diseases reported to the State Board of Health for the Month of July, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria. *	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
WARREN COUNTY—										
South Lebanon	Vil.									2
Waynesville	Vil.		1		7					2
Franklin	Tp.					1				
Hamilton	Tp.									1
Washington	Tp.			1	1					
Wayne	Tp.		1		4			3		4
Union	Tp.				2					
WASHINGTON COUNTY—										
Marietta			1							
Dunham	Tp.		1							
Liberty	Tp.			2						
Newport	Tp.								2	
Salem	Tp.		1							
Warren	Tp.	2	3							
Waterford	Tp.	1								
Watertown	Tp.	2				2				
Wesley	Tp.	1								
WAYNE COUNTY—										
Congress	Vil.		1		1					
East Union	Tp.									2
Greene	Tp.		1			1				
Paint	Tp.		1							
WILLIAMS COUNTY—										
Edgerton	Vil.				1	1				
Montpelier	Vil.							2	1	
Stryker	Vil.	2								
WOOD COUNTY—										
Bowling Green			2							
Bairdstown	Vil.						1			
Bradner	Vil.								1	
North Baltimore	Vil.								1	
Perrysburg	Vil.						1			
Bloom	Tp.					2				
Perry	Tp.								2	
Portage	Tp.						1			
Ross	Tp.	1			2	1				2
Washington	Tp.						1			
WYANDOT COUNTY—										
Carey	Vil.			1						
Nevada	Vil.				1					
Upper Sandusky	Vil.	1	1		3			2		
Ridge	Tp.				3					

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, JULY, 1915.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
ADAMS COUNTY—								
Jefferson .....Tp.	2				1			
Sprigg .....Tp.								a2
Wayne .....Tp.								
ALLEN COUNTY—								
Delphos .....Tp.	1	1			1			
Lima .....Tp.	4	4						
Lafayette .....Vil.	1							
Spencerville .....Vil.	4							
West Cairo .....Vil.	1							
German .....Tp.						1		
Jackson .....Tp.	1							
ASHTABULA COUNTY—								
Colebrook .....Tp.					1			
AUGLAIZE COUNTY—								
Wayne .....Tp.	2							
BELMONT COUNTY—								
Bellaire .....Tp.			1					b1
Martins Ferry .....Tp.				2				
Pultney .....Tp.	4							
Richland .....Tp.	1							
BUTLER COUNTY—								
Hamilton .....Tp.		2					2	
Middletown .....Tp.		1						
Madison .....Tp.							1	
CHAMPAIGN COUNTY—								
Urbana .....Tp.	1							
Jackson .....Tp.		1						
CLARK COUNTY—								
Springfield .....Tp.	1	1	1			1		
Mad River .....Tp.								c2
Springfield .....Tp.	2							
CLERMONT COUNTY—								
Loveland .....Vil.		4						
Williamsburg .....Vil.	1	1						
COLUMBIANA COUNTY—								
East Liverpool .....Vil.	1	1				1		
Leetonia .....Vil.	1							
CUYAHOGA COUNTY—								
Cleveland .....Tp.	1	4		2	12	58	1	b2 d1 e1
East Cleveland .....Tp.						1		
DARKE COUNTY—								
Ansonia .....Tp.	1							
DEFTANCE COUNTY—								
Farmer .....Tp.			1					
ERIE COUNTY—								
Sandusky .....Tp.	4							
FAIRFIELD COUNTY—								
Bremen .....Vil.	1							
FAYETTE COUNTY—								
Washington C. H. ....Tp.		1						
Green .....Tp.	2							
FRANKLIN COUNTY—								
Columbus .....Tp.	2					1		d1
Brown .....Tp.	1							
GALLIA COUNTY—								
Cheshire .....Tp.		1						
Gallipolis .....Tp.	2		2	1				
GREENE COUNTY—								
New Jasper .....Tp.	1							

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, JULY, 1915 — Continued.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Polomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
GUERNSEY COUNTY—								
Cambridge	3							
HAMILTON COUNTY—								
Cincinnati	22	16	6	2	1	6	4	
Norwood			4					
Addyston	Vil.	1	1		1			
Harrison	Vil.	1						
HANCOCK COUNTY—								
Washington	Tp.			1				
HARRISON COUNTY—								
Cadiz	Tp.	2						
HENRY COUNTY—								
McClure	Vil.	1						
Damascus	Tp.	3				1		
HIGHLAND COUNTY—								
Greenfield	Vil.	2						
Paint	Tp.	1						
White Oak	Tp.			1				
HURON COUNTY—								
Bellevue		1						
Norwalk			1					
JEFFERSON COUNTY—								
Steubenville		1			1			
Tiltonville	Vil.	1						
Wayne	Tp.	1						
KNOX COUNTY—								
Fredericktown	Vil.							bl
Brown	Tp.			1				
LAKE COUNTY—								
Mentor	Vil.	2				1		
LICKING COUNTY—								
Hanover	Tp.	2						
Hartford	Tp.	3						
Lima	Tp.	1						
McKean	Tp.		1					
LOGAN COUNTY—								
Perry	Tp.	1						
LORAIN COUNTY—								
Lorain		2	1				1	
Ridgeville	Tp.					1		
LUCAS COUNTY—								
Toledo		18	13			11		
MADISON COUNTY—								
London		1						
MAHONING COUNTY—								
Youngstown		21	4			2	1	dl
East Youngstown	Vil.	5						
Boardman	Tp.	1						
Ellsworth	Tp.	1						
MARION COUNTY—								
Montgomery	Tp.	2						
MONROE COUNTY—								
Sunbury	Tp.						1	
MONTGOMERY COUNTY—								
Dayton		6	27					
Perry	Tp.	1					1	
MORROW COUNTY—								
Chester	Tp.	1						
MUSKINGUM COUNTY—								
Frazesburg	Vil.	2	1					
OTTAWA COUNTY—								
Port Clinton	Vil.	3	5					
Danbury	Tp.	1						
Portage	Tp.		1					

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, JULY, 1915—Concluded.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
PERRY COUNTY—								
Corning					1			
PICKAWAY COUNTY—								
Muhlenburg .....Tp.								d1
PREBLE COUNTY—								
Somers .....Tp.							1	
ROSS COUNTY—								
Chillicothe	4	2						
Paint .....Tp.	2							
SANDUSKY COUNTY—								
Fremont	3							
SENECA COUNTY—								
Liberty .....Tp.	1							
STARK COUNTY—								
Canton		1	1		2			
Sugar Creek .....Tp.					1			
SUMMIT COUNTY—								
Akron					18	2	3	
Barberton	7	1					1	
Cuyahoga Falls .....Vil.	1							
Bath .....Tp.						1		
Green .....Tp.					1			
TRUMBULL COUNTY—								
Bazetta .....Tp.			4					
Hubbard .....Tp.	1							
TUSCARAWAS COUNTY—								
New Philadelphia	3							
WARREN COUNTY—								
Maineville .....Vil.	1							
South Lebanon .....Vil.	1							
WASHINGTON COUNTY—								
Beverly .....Vil.	1							
Dunham .....Tp.	1							
Warren .....Tp.	4					1		
Waterford .....Tp.		1						
WAYNE COUNTY—								
FredericksburgVil.	1							

a Dysentery. b Malaria. c Paratyphoid Fever. d Tetanus. e Rabies.

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Annual Reports.

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*Sanitary Record (Monthly), 1888 to 1894. Vol. 1 to Vol. 7.

*Ohio Sanitary Bulletin (Quarterly), 1895 to 1896. Vol. 1 and 2.

*Ohio Sanitary Bulletin (Monthly), 1897 to 1908. Vol. 1 to Vol. 12.

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Special Reports.

*Sources of Public Water Supplies of Ohio, Preliminary Reports. Vols. 1-5. 1897 to 1902 inclusive.

*Water and Sewage Purification in Ohio. 1 Vol. 1908.

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Division of Administration.

Laws of Ohio Relating to the Powers and Duties of Boards of Health. 91 pp. 1912.

Legal Powers of Boards of Health, by James E. Bauman, 7 p.

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The Problems of Public Health, by E. F. McCampbell, 29 p.

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The Teacher's Work in the Field of Public Health, by E. F. McCampbell, 9 p. Reprint Monthly Bulletin, June 1913.

Preventable Disease, by E. F. McCampbell, 20 p. Reprint Monthly Bulletin, August 1913.

The Abatement of Nuisances, by James E. Bauman, 13 p. Reprint Monthly Bulletin, September 1913.

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The Conservation of Public Health, by E. F. McCampbell, 16 p. Reprint Monthly Bulletin, January 1914.

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The Notification of Reportable Diseases, by James E. Bauman. Reprint Monthly Bulletin, April 1914.

* Out of print.

- Legal Procedures a Nurse Should Know, by James E. Bauman, 6 p. Reprint Monthly Bulletin, June 1914.
- Rural Sanitation, by John W. Hill, 7 p. Reprint Monthly Bulletin, July 1914.
- The Relation of the Funeral Director and Embalmer to the Public Health, by E. F. McCampbell, 10 p. Reprint Monthly Bulletin, July 1914.
- Orders and Regulations for Villages and Townships, by James E. Bauman, 18 p. Reprint Monthly Bulletin, August 1914.
- Medical Education in Hygiene and Public Health, by E. F. McCampbell, 10 p. Reprint Monthly Bulletin, November 1914.
- How Rural Health Officers Can Assist City Health Departments, by J. H. Landis. Reprint Monthly Bulletin, December 1914.
- Health Improvements Needed in Ohio, by H. T. Sutton, 9 p. Reprint Ohio Public Health Journal, February 1915.
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- The Health Department Under the Commission-Manager Form of Government, by J. R. McDowell, 6 p. Reprint, O. P. H. J., July, 1915.

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- Disinfection and Disinfectants. 4th edition. 11 p. 1908.
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- The Duration of Quarantine in Transmissible Diseases. Frank G. Boudreau, 10 p. Reprint Monthly Bulletin, May 1914.
- The Trachoma Situation as It Concerns Ohio, by E. F. McCampbell, 11 p. Reprint Monthly Bulletin, July 1914.
- Simple Facts About Common Diseases. by Frank G. Boudreau, 25 p. Reprint Monthly Bulletin, July 1914.
- An Outbreak of Typhoid Fever Due to Contamination of the Water Supply Through a Private Connection, by W. H. Dittoe and Frank G. Boudreau, 11 p. Reprint Monthly Bulletin, July 1914.

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- Market Milk. An Important Factor in the Spread of Communicable Diseases, by Frank G. Boudreau, 18 p. Reprint *Monthly Bulletin*, August 1914.
- The Differential Diagnosis of Epidemic Cerebrospinal Meningitis, by Frank G. Boudreau. 6 p. Reprint *Monthly Bulletin*, November 1914.
- Methods and Channels of Infection, by E. F. McCampbell. Reprint *Ohio Public Health Journal*, January-February 1915.
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- The Problem of Infant Mortality in Cities, by F. G. Boudreau and Sara Kerr. 16 p. Reprint from *Ohio Public Health Journal*, May, 1915.
- Limitations of Prevention of Communicable Diseases, by Martin Friedrich. 7 p. Reprint, *O. P. H. Jour.*, June, 1915.
- Protective Inoculation Against Disease, by E. F. McCampbell, 18 p. Reprint, *O. P. H. J.*, July, 1915.
- The Lessons from a Smallpox Epidemic, by Chas. A. LaMont, 8 p. Reprint, *O. P. H. J.*, July, 1915.

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- The Prevention of Consumption. 3rd edition. 6 p. 1910.
- How to Avoid Consumption. 6 p. 1911.
- Directions for Living and Sleeping in the Open Air. 24 p. 1913.
- A Survey of the Tuberculosis Situation in the State of Ohio. 49 p. 1912.
- Tuberculosis Equipment in the State of Ohio. 17 p. 1913.
- Tuberculosis—What You Should Know About It. 20 p. 2d edition. 1914.
- Open Air Schools, by Aug. F. Foerste, 26 p. Reprint *Monthly Bulletin*, March 1912.
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- Ohio and Its Tuberculosis Problem, by Robert G. Paterson, 11 p. Reprint *Monthly Bulletin*, November 1912.
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- The Relation of Animal to Human Tuberculosis, by E. C. Schroeder, 14 p. Reprint *Monthly Bulletin*, July 1913.
- Campaign Against Tuberculosis in Ohio, by Robert G. Paterson, 8 p. Reprint *Monthly Bulletin*, November 1913.
- Present Status of the Tuberculosis Work in Cleveland, by R. H. Bishop, Jr., M. D., 16 p. Reprint *Monthly Bulletin*, June 1914.
- Tuberculosis in State Institutions, by Starr Cadwallader, 4 p. Reprint *Monthly Bulletin*, June 1914.
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- The Relation of Private and Municipal Anti-Tuberculosis Activities, by Isabel W. Lowman. 10 p. Reprint *Monthly Bulletin*, November 1914.

- The Value of the Public Health Nurse to Local Health Authorities, by R. G. Paterson, 7 p. Reprint Monthly Bulletin, September 1914.
- What I Learned About Tuberculosis, by Austin M. Patterson, 8 p. Reprint Ohio Public Health Journal, February 1915.
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- Some Filtration Plant Bacteriological Data, by R. D. Scott. 8 p. Reprint, O. P. H. Jour., June, 1915.
- The Tuberculosis Problem, by J. H. Landis. 11 p. Reprint from Ohio Public Health Journal, March, 1915.
- Public Health Nursing in Ohio, by Helena R. Stewart. 8 p. Reprint from Ohio Public Health Journal, April, 1915.
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- Information Concerning the Hygienic Laboratories.
- Outfits for Chemical and Bacteriological Field Determinations, by L. H. Van Buskirk, 10 p. Reprint Monthly Bulletin, April 1913.
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- Certain Foods and their Relation to Disease, by Martha Koehne. 13 p. Reprint from Ohio Public Health Journal, April, 1915.

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- How About Your Work? 4 p. 1913.
- The Significance of Occupational Diseases and Their Classification. 10 p. Reprint Monthly Bulletin, June 1913.
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- Plumbism in the Industries of the Middle West, by Alice Hamilton, 11 p. Reprint Monthly Bulletin, Jan.-Feb. 1913.
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- Industrial Poisons. 33 p. Reprint Monthly Bulletin, December 1913.
- Laws of Ohio Relating to Occupational Disease and Industrial Hygiene. 30 p. 1913.
- Health Hazards of Industries, by E. R. Hayhurst. Reprint Monthly Bulletin, April 1914.
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- Critical Examination of 100 Painters for Evidence of Lead Poisoning, by E. R. Hayhurst, 16 p. Reprint, American Journal of the Medical Sciences, June 1914.
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- A Survey of Industrial Health Hazards and Occupational Diseases in Ohio, by E. R. Hayhurst, February, 1915. 438 p. 101 illus.
- The Industrial Hygiene of Factory Processes (General), in Ohio, by E. R. Hayhurst, 9 p. Reprinted from Ohio Public Health Journal, January 1915.
- A Survey of the Industrial Hygiene of Furnacing, Forging and Blacksmithing, Coremaking, Iron Founding and Brass Founding, by E. R. Hayhurst. 15 p. Reprinted from Ohio Public Health Journal, February, 1915.
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- The Disinfection of Water, by Roger G. Perkins, M. D., 9 p. Reprint Monthly Bulletin, March 1911.
- Algae and Their Relation to Public Water Supplies, by L. H. Van Buskirk. 6 p. Reprint Monthly Bulletin, August 1912.
- *Notes on the Hypochlorite Treatment of Public Water Supplies in the United States and Canada, by W. H. Dittoe and R. F. MacDowell. 9 p. Reprint Monthly Bulletin, Oct. 1912.

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THE RELATION OF CARRIERS TO THE SPREAD OF DISEASE.*

By E. F. McCAMPBELL, PH. D., M. D.

Secretary and Executive Officer, Ohio State Board of Health.

While it cannot be said that medicine has yet reached the stage in its development when it can be regarded as an exact science, yet it must be admitted that many remarkable scientific achievements have been witnessed in this field during recent years. This has been especially true during the last fifteen or twenty years. An investigation of medical history shows two developmental periods which interlace with each other to some extent. In the earlier days our ideas of disease and its treatment were quite indefinite and general and were founded in the main on hypotheses and theories which had no particular scientific basis. In later years, research and experimentation have furnished the scientific basis for the establishment of various facts and for certain seemingly sound theories in addition. It is true, some of the theories brought forth have been illogical deductions from the facts at hand, others have been formulated as a result of false evidence, improper technic, etc. It is fair to say, however, that medical theories propounded as the result of scientific research are much safer than those originating in the inner recesses of a dreaming mind. It can be said, therefore, that the early periods of generalization in medicine have passed and we are now working in the age where legitimate progress can only be made as a result of careful research and experimentation. Some practitioners of medicine, as we all know, have made little progress as the science has been developed. They practice in the same way they did years ago and look upon modern methods of diagnosis and treatment as absurd in the extreme. They make no attempt to familiarize themselves with medical literature nor do they utilize the laboratory to aid them in their work. It should be stated in fairness also, I regret to say, that the above statements apply with equal force to some of our younger practitioners.

It is possible nowadays to practice what may be called scientific medicine. A large group of young and old practitioners in this state and in this country are trying to practice scientific medicine but a much larger group are only pill dispensers who are capable of earning only a meager living, and they gamble on the fact that a large per cent of those ill will eventually recover. It should be noted that those persons who are not mortally ill will recover much more quickly in the hands of a skilled physician, surgeon, or specialist, and a much larger per cent of those who are seriously ill will recover when in skillful hands. I wish to raise the question as to how many physicians really examine their patients and attempt to make a scientific diagnosis? How many do not examine their patients thoroughly, relying on what may be

* Read before Columbus Academy of Medicine, September, 1915.

called intuition or on the patients themselves to establish a diagnosis? How does the average physician handle the patient who comes into the office making the statement, "Doctor, I have diarrhoea," or, "I have a cold?" Does he examine the case thoroughly and scientifically and prescribe accordingly, or does he go to his medicine cabinet and take down immediately the bottle of tablets marked "Cold Preferred," or "Diarrhoea." Again, how many of such practitioners can accurately state the proportions of the ingredients in the tablets which they so frequently prescribe? How many of the practicing physicians both young and old can write a scientific prescription? I have made some observations along these lines as have many of you, no doubt. Only one conclusion is reached and that is that comparatively few physicians practice scientific medicine. Some say that the patients will not pay for such services and that it is not worth while to attempt to study the cases thoroughly. This statement I doubt but even if it is true in a minority of cases, I say that such a physician is prostituting himself and his profession. We might in a way excuse the very ignorant practitioner for following such methods but no possible excuse can be offered for the plain grafter who knows better and proceeds along the even tenor of his way.

Again, we find certain so-called specialists following the same general methods as referred to above. Here there is absolutely no excuse for desultory methods. The fees are quite sufficient in most instances. Each case should receive the most careful attention. There are many specialists who practice scientific medicine, there are many so-called specialists who try to practice scientific medicine but are not qualified, and there are other so-called specialists who do not even try to practice scientific medicine but direct their every effort entirely toward securing the fees. There is only one remedy for this situation and that is the adoption by the state of certain legal requirements before allowing the medical graduate to practice a specialty. Among the specialties I would include all branches of surgery, ophthalmology, rhinology, otology, skin diseases, or any particular field of internal medicine. A doctor of medicine should have no right to set himself up as a specialist in a subject until he has met certain minimum requirements of study, research, and experience under other persons of unquestionable reputation.

I wish to emphasize then the necessity of practicing medicine in the most thorough manner possible. All modern methods of procedure should be utilized. Every person who would practice his profession in a scientific manner should in the first place be familiar with the current medical literature. He or she should utilize the microscope, the X-ray, the hemoglobinometer, the hemocytometer, the ophthalmoscope, the blood pressure registering instruments, and other instruments of precision, if such are available. They should also be familiar with the chemistry and cytology of the blood, the urine, the feces, the sputum, the stomach contents, and the other secretions and pathological accumulations, such as exudates and transudates. A thorough working knowledge of normal anatomy, physiology and pathology is the key to the practice of scientific medicine. These are without doubt basic factors. All other information and necessary attributes may be easily acquired by any one of average intelligence.

The question no doubt arises in the mind of some as to the relation of the above discussion to the subject at hand, namely, "carriers of disease." The relation is quite direct. Most epoch-making discoveries during

recent years and the greatest increases in our medical knowledge have occurred in connection with the infectious diseases. It may occur to you that there is no lack of knowledge among the medical profession in regard to the infectious diseases and their control and treatment. I have been in a position during the last few years to make some observations on this matter. The situation cannot be regarded as satisfactory. Surprisingly few physicians are familiar with the modern methods of diagnosis, control and treatment of this rather common group of diseases. I make this statement advisedly and with a full appreciation of the fact that there may be some who will differ with me and that there are others who have had ample opportunity for accurate observation and who are really scientific practitioners and investigators who will support the contention.

In addition to the great work which has been done on the etiological relationship between certain microbes and other parasites and disease, the development of certain curative and prophylactic sera and vaccines, and still more recently the development of certain chemo-therapeutic agents is especially noteworthy. The epidemiology of various diseases has received very careful consideration and many important facts have been established. It should be borne in mind that the object point of all work in scientific medicine is the *cure of disease*. This is the point toward which all research is directed. There seems to be no direct route to the desired end. Often problems are studied which seem to produce no result, which seem to lead no nearer the solution, and which often seem purposeless. After all, such work has its value. With the cure of disease before us as the main problem it has been found by careful study that the same result may be accomplished by the establishment of means of *preventing disease*. Such work is certainly almost as important as curing disease. The earlier ideas of the spread of disease have not been found to be entirely correct. Certain facts have been established proving, in many instances, the cause of certain diseases, their point and channels of infection, their route of exit from the body and also, in some cases, methods of preventive inoculation have been perfected. It seems that most infectious diseases are transmitted directly from the patient to the healthy individual. Such being the case it would seem that if preventive measures were applied directly to the patient and the immediate surroundings the spread of the disease would be checked at once.

The modern scientific practitioner of medicine sees that all secretions and excretions of the body are promptly disinfected and that all articles coming in contact with the case are treated in the same manner. It is noted, however, in many instances that the spread of the disease is not checked by the application of these methods. The scientific practitioner now recognizes the existence of another means of transmission in many of the infectious diseases, namely, transmission by means of the disease carrier. These carriers are often persons or animals who, apparently in sound health, harbor within their bodies and eliminate from their bodies particular disease-producing organisms. There has been much discussion in the medical literature in recent years on the existence and the methods of treating and controlling certain of the "bacilli carriers." Many of you are familiar with this discussion which has centered around the so-called "typhoid carrier" which has been perhaps the most studied. I would direct your attention, however, to the extent to which this condition exists in connection with most, if not all,

of the acute infectious diseases and in certain other diseases which are not so classed but in which infectious microorganisms exist and are probably the etiological factors. It has long been known that the acute infections spread in most unexpected ways and no satisfactory explanation was at hand until a proper understanding of the disease carrier question had been presented.

The existence of germ carriers has been known for many years. It seems strange that their proper significance has not been duly appreciated until recently. In 1880 General Sternberg and also Pasteur noted the presence of an organism in the mouths of seemingly healthy persons, which was identified as the cause of sputum septicemia. Many years later it was proved that organisms of this group were the cause of the majority of cases of lobar pneumonia. One of these organisms is called the pneumococcus (*Str. pneumoniae*). This organism is responsible for practically 60 per cent of the cases of lobar pneumonia and is carried in the mouths and in the sputum of all convalescent cases of lobar pneumonia and in the mouths of about 40 per cent of normal individuals. Again in 1883, Loeffler, who reported the discovery of the microorganism causing diphtheria, also reported the finding of this microorganism in the throats of seemingly healthy persons. The true significance of its presence was not appreciated. During the last few years considerable work has been done in order to determine the true significance of the microbe carrier and also to devise ways and means by which the microorganisms may be eliminated from the body.

Germ carriers or microbe carriers may be conveniently divided into four groups: (1) The infected human or animal suffering from the disease; (2) The infected human or animal convalescing from the disease; (3) The human or animal fully recovered from an attack of the disease but still carrying the microbes in the body and eliminating them from the body, (chronic carriers); and (4) The human or animal never attacked by the disease in question but carrying and disseminating infectious microorganisms, (healthy carriers, precocious or primary carriers). It should be stated that the presence of the etiological microorganisms in the acute stages of an infection is a necessary condition and the persistence of the microorganism during convalescence may also be expected. In other words, we recognize and can easily explain the first two types of carriers. In the third group, above referred to, the key to the situation may be readily obtained in many instances by careful analysis of the personal history, which shows an attack of the disease sometime previously. However, it is the fourth group that furnishes the most interesting field for investigation. It may be noted that in a certain small per cent of cases the so-called healthy carrier is in the incubative stage of the particular infectious disease and may develop the disease later. The most interesting group of healthy carriers are those which have never had an attack of the disease, and are not in the incubative stage of any disease. Frequently these cases have never been in contact, as far as their knowledge or the information goes, with any cases of the particular disease in question and still they show on careful examination the particular microorganisms within their bodies.

As previously referred to, the typhoid carrier has been the most studied. It is the type with which you are most familiar but it seems advantageous to call attention to a few important facts in this connection. It should be remembered that the *Bacillus typhosus* is accepted as the cause of typhoid

fever. It may be interesting for you to know that absolute scientific proof of this fact has not been available until within the last few years. This microorganism is present in the intestines, in the internal organs, and in the blood in cases of typhoid fever. Often its appearance in the blood is quite early in the disease, as is shown by blood cultures. Usually after the twelfth day the organisms are eliminated in the urine. This elimination usually continues for a long period of time, even after the patient has fully recovered and in many cases for months. The bacillus is also eliminated from the intestinal tract for a long period of time. It has been demonstrated that not uncommonly attacks of typhoid fever occur without being diagnosed and without serious inconvenience to the person infected. Such a person may develop into a carrier. It has been demonstrated also in typhoid fever that there are certain individuals who temporarily harbor bacilli after drinking infected water or milk. The organism seems to reproduce to a limited extent but produces no evidence of infection. Such a carrier can only be recognized after a careful bacteriological examination of the blood and the discharges from the body. Such individuals are in a state of what might be termed natural immunity. During an attack of typhoid fever the bacillus usually disappears from the excretions about ten or eleven days after the disappearance of the fever. This is true in 90 per cent of the cases. In the remaining 10 per cent the bacillus is eliminated for longer periods of time. Extensive studies have shown that about 2 to 5 per cent of the individuals who have had the disease develop into chronic typhoid carriers. In certain instances the bacilli are carried until the death of the individual. They are usually localized in the gall bladder and biliary passages and are not infrequently found in the bile and biliary calculi. They reach the intestinal tract usually by means of the bile which exercises no antiseptic action upon them. It has been also shown recently that the organisms rarely occur in certain foci in other organs of the body and in lesions of the periosteum and bones. A study of the statistics shows that adults are most liable to develop the typhoid carrier condition and that among the adults, women most commonly develop this condition. It has been established that about 10 per cent, if not more, of the cases of typhoid fever which occur, are due to the spread of the disease by carriers. The dissemination in these instances usually occurs by means of the food supply.

The facts which have been developed in regard to the carriers in typhoid fever apply equally as well in quite a number of other diseases, such as paratyphoid fever, which is frequently mis-diagnosed because blood cultures are not taken, cerebrospinal meningitis of the epidemic form, infantile paralysis, influenza, cholera, amebic and bacillary dysentery, and the pneumonic form of plague. The carrier condition exists very frequently in connection with cholera. The disease has been kept out of this country within recent years, and especially within the last two years by means of the examination of the stools of all passengers in steerage arriving on the oceanic vessels which are detained at our various quarantine stations. Cholera carriers are found not infrequently and are immediately deported. In all probability the carrier condition prevails in connection with smallpox, chickenpox, measles, and scarlet fever. The exact cause of these diseases is not known. They are probably due to the ultramicroscopic viruses. There are also many other infectious diseases which are carried by means of seemingly normal indi-

viduals. Many of these are tropical diseases and a discussion of the details of their transmission by human beings, animals, and invertebrates is only of academic interest in this country.

One of the most interesting situations occurs in connection with the transmission of Malta fever which is caused, which perhaps many of you know, by the *Micrococcus melitensis*. This disease is transmitted in a large per cent of instances through the medium of goats' milk. About 50 per cent of the goats on the Island of Malta are infected and about 10 per cent it is stated on reliable authority, excrete the micrococcus through their milk. The disease in the goat is seemingly unnoticeable. The microorganisms usually localize in the mammary glands. The transmission of the disease to man may be prevented by boiling the goat's milk. As far as the carrier condition is concerned Malta fever in man resembles very closely typhoid fever.

Various methods have been devised for the treatment of the carrier condition in typhoid fever. Typhoid vaccines have been used, as well as various and sundry intestinal and urinary disinfectants. Surgery has been resorted to, the gall bladder and duct being removed. In certain instances the condition has been cured. It may be stated, however, that as yet no sure cure for the carrier condition in any of the diseases mentioned has been devised. If we are to eliminate these diseases as menaces to the public health in every community, it is quite plain that certain other measures must be adopted to handle the carriers, even after the purity of the water and food supplies is assured and the isolation and disinfection of all infected cases is carefully carried out.

Some interesting facts have been established in regard to the carrier condition in diphtheria. It has been shown that diphtheria carriers never occur in communities which are free from diphtheria. It would seem in this case that rather intimate association with a case of diphtheria is a prerequisite to the development of the carrier condition. This is not true in connection with many of the other diseases. About 30 per cent of those individuals coming in contact with cases of diphtheria develop the carrier condition, which persists for varying periods of time. Careful examination on a large scale in many communities have shown about 3 per cent of all individuals to be diphtheria carriers. The carrier condition does not persist in diphtheria as long as in some of the other diseases mentioned. Examinations show that most diphtheria carriers possess a certain amount of antitoxin in their blood. The diphtheria bacillus is usually carried in the nose and throat. Antiseptic sprays, corrosive disinfectants, and diphtheria vaccines seem to be of little value. Attention should be directed in this connection to the fact that diphtheria antitoxin when injected has absolutely no effect upon the carrier condition. I mention this because within recent years we have observed that the use of diphtheria antitoxin has been resorted to by certain physicians in order to clear up the carrier condition, which is shown to exist by bacteriological examination. It is the physician's duty to make sure that no diphtheria bacilli are present by careful and repeated bacteriological examinations before the patient is released from quarantine. It is the physician's duty also to conduct a bacteriological examination of the noses and throats of all individuals who have been in contact with the case in order that healthy carriers may be detected.

The question of certain animals acting as carriers of diphtheria has been

investigated to some extent. The scientific evidence on this question is not complete. From our own examinations, however, it may be stated, we are reasonably sure that the domestic cat is sometimes a carrier of the disease. It may be readily assumed that the cat or any other animal may act as a mechanical carrier of the infected excretions of a diphtheria case. However, it has been shown that the diphtheria bacilli are not infrequently found in the noses and throats of cats, which have been in contact with diphtheria cases. I know of no experiments which have been performed in which the diphtheria bacilli have been taken from the cat and inoculated into man, thereby producing the disease. This is the one point which has not been proven. Bacteriological tests show the organisms to be typical diphtheria bacilli. In the light of the evidence at hand, it is obviously necessary for the modern physician to see to it that such animals are excluded from the sick room and from the premises where cases of this disease exist.

While human and animal carriers of disease are to be regarded as the most important in the transmission of the diseases which occur in this country, their activities are quite overshadowed, especially in the tropical countries, by the importance of the invertebrate carriers. These invertebrate carriers of disease are conveniently grouped into two classes, namely, the *mechanical or passive carriers*, and *active carriers* in which the parasite has entered the tissues of the carrier and is eliminated by the carrier after a varying period of time. The activities of the mechanical or passive carrier may be regarded as purely accidental. The various varieties of flies, as you all know, may accidentally feed upon the excretions of cases of typhoid fever, cholera, tuberculosis, and dysentery. In so doing they take up disease-producing microbes on their feet and on their probosces, and consequently may transfer these microbes to various food products, or directly into wounds in the skin of the human or the animal. The active invertebrate disease carrier is, of course, the most interesting. As previously stated, in this case the parasites are taken up by the carrier and enter its tissues. A definite infection, or perhaps it would be better to say an infestation, is produced which may or may not influence the physical constitution of the carrier in question. For example, it is known that two different varieties of mosquitoes are concerned in the transmission of malaria (*Anopheles*) and yellow fever (*Stegomyia*), and in this case the parasites causing these diseases undergo a definite period of their life cycle in the bodies of the mosquitoes. It requires considerable time for the parasites to pass through the stomach wall of the mosquito into the lymphatics and finally to the salivary glands. The parasites multiply in the bodies of the mosquitoes and are thrown out in a somewhat different form than when they were taken in originally into the stomach when these insects bite. The period of the cycle in the case of the malaria mosquito is about seven or eight days and in the case of the yellow fever mosquito about twelve days. In the intervening time the mosquitoes are not infectious. It is only the female *stegomyia* mosquito which is concerned in the transmission of yellow fever. It was supposed for a long time that active invertebrate carriers were only concerned in the transmission of the protozoal diseases and were not concerned in the transmission of bacterial diseases. This has been found not to be the case.

For example, the common rat fleas are active carriers of Bubonic plague, which, as you know, has been present in this country since 1906. The disease

is transmitted from rat to rat and from rat to man by this agency. The disease is essentially a chronic disease of rats of various species, and while these rodents suffer from acute attacks and frequently die, they are to be regarded as the chronic carriers of this infection. When a flea feeds upon an infected rat or an infected human being, the bacteria are taken up directly into the digestive tract and the flea actually becomes infested with the germs. These germs multiply very rapidly in the stomach and esophagus of the flea and are reported to persist from four to three weeks, depending upon the temperature and feeding habits of the flea. The organisms leave the body of the flea, which gives no particular evidence of being seriously infested by the presence of germs, entirely by way of the intestinal tract. Infection of the human by an infected flea occurs mechanically through the wound made by the bite. As the flea bites and sucks up blood into the stomach, fecal matter is deposited around the wound. This material not infrequently enters the wound thereby producing the infection. Fleas are also concerned in the transmission of certain protozoal diseases, such as those produced by the *Trypanosoma lewisi* in rats. In this instance the trypanosomes multiply in the epithelial cells in the intestinal tract of the flea, and the flea regurgitates the newly formed parasites from the stomach. In this instance as the flea bites the regurgitation takes place directly into the wound. Dog fleas are also said to be responsible for the transmission of infantile kala-azar. This disease does not occur in this country and the actual mechanism of transmission is not known.

Ticks are concerned in the transmission of several diseases of man and animals. Among the diseases occurring in this country the only one affecting man is Rocky Mountain fever, which occurs in the northwestern Rocky Mountain states. The exact cause of this disease is not known. In all probability it is bacterial in origin. Texas fever in cattle is also transmitted by means of a tick, although of a different variety than that which transmits Rocky Mountain fever. In the case of Texas fever the parasites are taken up when the tick feeds upon an infected individual. The parasites enter the tissues of the tick and eventually are thrown out in the eggs of the female. On hatching, the young immediately feed and in so doing inoculate the parasites directly into the uninfected individuals. The parasite in Texas fever is a protozoan piroplasma (*P. bigeminum*.) A great many of the spirochetel diseases are transmitted by ticks and occasionally by the louse. For example, this is true of African tick fever and certain tropical diseases of chickens.

The tsetse flies (*Glossina*) are concerned in the transmission of quite a number of tropical diseases which affect man and animals. It was first thought that these flies acted only as mechanical carriers of infection. It has been demonstrated that they are in fact active carriers and that the parasites undergo multiplication in the body of the insects. It is probable also that great mechanical transmission occurs but rarely unless the feeding of the fly is interrupted. In this connection it should be stated that in quite a number of the protozoal diseases, such as nagama, dourine, mal de caderas, and the like, which affects domestic animals, it has been noted that certain wild animals serve as reservoirs, so to speak, for the virus. These wild animals, such as the brush buck, the antelope, and the wildebeast, are chronically infected. The flies feed upon the wild animals and then transfer the infection to the domestic animals. In certain parts of the tropics such trypano-

some diseases, as have been mentioned, have been entirely eliminated by driving out the wild animals.

Human sleeping sickness, a trypanosome disease, (*Tr. gambiensi*) is transmitted through the agencies of the tsetse fly. In this case the parasites undergo multiplication in the stomach of the fly which does not become infectious for a period of about three weeks after ingestion of the infected blood. After this time the flies remain infectious until they die. They are thrown out at the time the fly bites; regurgitation from the digestive tract into the wound taking place.

It has been demonstrated that the body louse and occasionally the head louse are capable of transmitting typhus fever in man. It is probable that the louse is not the only means by which this disease is transmitted. This disease occurs in certain tropical countries, as well as in Mexico, along our borders, and in certain of our inland states. Brill's disease has been known to occur in certain of our eastern states for several years. This disease is modified typhus fever. The disease is frequently mis-diagnosed. Without doubt several cases of this disease have occurred in Ohio and have not been recognized. Only one positive case has been reported to the State Department of Health during the last six months. No new cases developed from this focus. The case was in charge of one of the most eminent internists in the state and no question can be raised as to the accuracy of the diagnosis. The louse is supposed to be concerned also in the transmission of relapsing fever in man and certain trypanosome infections in the common rat.

The bed bug may be concerned in the transmission of relapsing fever also, as well as in the transmission of plague and kala-azar. Certain sand flies are also under suspicion now as being concerned in the transmission of certain tropical fevers and also often suggested as being active carriers of infecting agents of pellagra, if such agents exist. There is no conclusive evidence available on this point. On the other hand the available evidence seems to indicate that pellagra is a metabolic disease.

I use the foregoing discussion in regard to disease carriers, therefore, to emphasize the necessity of paying attention to the newer developments in the field of scientific medicine. It is evident that the physician nowadays cannot practice this profession scientifically unless he or she takes advantage of all legitimate progress. Thus in controlling and treating infectious diseases, for example, one must be familiar with the investigations of the disease carrier question, just as one must be familiar with the use of the various instruments of precision, which aid in the diagnosis of disease, and the new therapeutic agents which have been suggested and proven worthy. In the field of the specialties it is obviously necessary to keep pace with the development of improved technic, new instruments, appliances, etc.

In conclusion, I plead, if you please, for the most thorough and scientific practice. It is only by the adoption of well established scientific methods that it will be possible to reach the goal which we desire to reach, namely, the cure of disease. When the public is convinced that the various members of the medical profession know their business, the field of activity of the quack and the charlatan will be materially reduced. The fakers exist nowadays because of a seeming public demand and they will not be eliminated until the same public demands their elimination. We condemn the quack for his

methods but a close examination of the methods of many of our own so-called regular practitioners shows evidence of the use of the same methods.

I urge, therefore, that all self-respecting practitioners strive to elevate the profession by the use of the scientific methods and procedures which are now available.

THE WAR, HYGIENE, AND THE PUBLIC HEALTH.

BY FRANK G. BOUNDEAU, M. D., A. M.

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A recent statement in regard to the increase in infant mortality in England and Wales during the last few months led to an inquiry as to the cause of this increase. It was found that a number of charitable organizations supported by private philanthropy had ceased to extend their benefits to the children of the poor. Working mothers who formerly had left their young children in the care of the day nurseries supported by these organizations during working hours, were now forced to pay ignorant neighbors for this service. The enlistment of countless working men forced women to assume the burden of supporting the family, and the children were consequently neglected. For the same reason and also because of the scarcity of food and the consequent rise in prices, poverty was rife, and poverty is the boon companion of disease. The scarcity of physicians occasioned by the military demand for medical men resulted in a lack of care of individual cases and had depleted the ranks of public health officials. As a result of this the control of epidemic and preventable diseases was not so rigid as before the war, and a larger toll of infant life resulted. This increase of infant mortality and its causes are instances of the manner in which the war has thrust its tentacles into every avenue and walk of life. It has been said that no country on the globe will remain unaffected, and certainly no individual within the boundaries of the warring nations will remain outside its sphere of influence. Every public expense that can possibly be spared is being ruthlessly cut down, and this pruning process will not abate as the struggle lengthens and the resources of the combatant nations are strained to their utmost. For years after peace is declared the accumulated expenses of the struggle will be first mortgages upon the public treasuries, and the present generous expenditure of money for the advance of social welfare in all its ramifications will be a thing of the past. With less money for public health work an increase in morbidity and mortality among the civilian population will probably result. In Germany and Austria the war is playing havoc with workmens' insurance. From the enlisted workmen no premiums can be expected. The organized state insurance companies have large reserves, but these may soon be lost, and in anticipation of this the companies are already retrenching. One step already taken bids fair to have an important influence in furthering the spread of tuberculosis. Previous to the war it was the custom of these companies to send insured workmen afflicted with tuberculosis to sanitariums, but in order to cut down expenses, these cases are now allowed to remain at home. The influence these bacilli-spreaders will

have in increasing the prevalence of the disease is feared. Another important influence of the war upon the public health will be felt in those portions of Europe devastated by invasion, and particularly Belgium, France, and Poland. We are informed that the civilian population refuses to leave this territory and the ordinary pursuits of life are carried on even within range of the heavy artillery. The sanitary conditions within these districts must be terrible indeed. In municipalities it is probable that the water supplies are contaminated or destroyed. The systems of sewerage must be ruined. Dead men and horses, and other decaying organic material have given rise to a plague of flies. Lastly, in those districts in which the pendulum of invasion has swayed back and forth, all organized control of public affairs has ceased and pestilence is allowed to have unrestricted sway. Worse than all this is the poverty which has been shown to be the very basis of many public health problems. It will be a gigantic task to reorganize sanitary affairs in this territory when invading armies are withdrawn for the last time.

The confluence of men from all parts of the world has brought with it great danger from a number of diseases which are of rare occurrence in some of the countries at war. Typhus fever which has not been seen in epidemic form in Germany for years, is now epidemic in a number of the Russian prison camps. Cholera and plague are prevalent in Austria and Serbia; typhoid fever has raged in Belgium; dysentery has become a problem in several of the armies, and even smallpox is not unknown.

Among other present and future results of the war, the check to research in public health problems must be noted. The medical and public health journals of the warring nations are filled with war news. While it is true that much valuable research work in military hygiene will be recorded, this is hardly of a nature to be of very great service in times of peace, although this must remain for the present a moot question. At any rate the war has checked the new work in public health problems which was being carried out so extensively in Germany, France, Austria, and England prior to the rupture.

In spite of the cloud of war, a faint silver lining can be seen. The work of medical men and sanitariums in protecting the health of the troops has commanded the respect and admiration of the world. Valuable information is being collected concerning the epidemic diseases occurring among the soldiers, and preventive inoculation has received a wonderful trial. It is possible that the prestige earned by the sanitary service in the war will enable public health workers to gain more recognition than has been accorded them before, and perhaps larger appropriations as the utility of their work is better appreciated. The poverty occasioned by the war, however, will act as an automatic check as far as larger public health appropriations are concerned. No matter what the outcome of the war, as far as preventative medicine is concerned, it is our duty to study all phases of the sanitary side of it, and to profit by the information secured as a result of the reaction between the collection of huge bodies of men in armies, and a new, and in many ways, strange environment.

The decade prior to the declaration of war had been very fruitful in the progress of social welfare. In the more limited field of public health even greater progress had been made. Although it was a period characterized by great discoveries and developments in preventive medicine, the advances of public health organization were equally rapid, and the new facts and dis-

coveries were quickly and practically utilized. Searching investigations had shown that the causes of preventable diseases were deeper than bad housing, unsanitary plumbing, or even the specific exciting agents. The underlying predisposing causes were found to be more deeply imbedded in the social fabric than these. Poverty was found to be the basis of unsanitary conditions, and the manifold sources of poverty were traced to their lair. The poorly paid workman who lived in a shaky tenement was poor because of ill health. The ill health of workmen was traced to exposure to industrial health hazards, such as long hours, dark, dirty and dusty environment, and crippling accidents. Shorter hours and the removal of industrial hazards rendered the workmen more healthful and correspondingly more efficient. The problem of poverty was attacked by private organizations which became associated, and finally the burden was laid where it belongs, on the state. Workmen's compensation, industrial insurance and kindred acts were an expression of this movement. All these social and public health advances have been distributed in the European nations by the shock of war. While it may be years before the full effect of the war will be felt, enough information is filtering through the censors at the present time to make interesting reading for the neutral bystander who is concerned with any movement affecting social welfare.

Of the preventable diseases affecting the soldiers and civilian population in Europe, Bubonic plague, Asiatic cholera, Typhus fever, Typhoid fever, Tetanus, Dysentery, Epidemic cerebrospinal meningitis, and various forms of wound infection are the more important. Diseases which were thought to be unimportant have assumed an important place as causes of morbidity, and diseases guarded against and prophesied as important causes of sickness have been rare. Thus typhoid fever has been comparatively rare, and in some of the armies at least the incidence has been less than among the civilian population unaffected by the war. On the other hand tetanus has become a much greater problem than was anticipated and the demand for anti-tetanic serum has far exceeded the supply. Gas gangrene and trench fever are names which are rare in times of peace, but these conditions are constantly encountered in the military hospitals. The venereal diseases are always associated with wars. Long ago it was the custom for women of doubtful character to follow the army, and even Napoleon found it impossible to prevent this. These women acted as nurses and also contributed largely to the spread of venereal diseases among the soldiers. With the organization of the sanitary corps the need for these women diminished but venereal diseases continued to be more prevalent among the soldiers than among the civilian population. During the last half of the Franco-Prussian war venereal diseases formed 9 per cent of the total morbidity. According to a German authority a large number of cases of syphilis and gonorrhea had already occurred among the German soldiers prior to October 1, 1914. The same authority states that even on a peace footing there is a daily average of 1,748 men under treatment for this cause in the Austrian army. These reports seem quite reasonable in the light of reports of the prevalence of venereal diseases in our own army and navy.

The problem of furnishing hospital facilities for the immense numbers of wounded is certainly of interest to public health officials and would fill a volume by itself if even an approximately complete account could be given. In fact the care of the wounded from the time the wound is received until

they are returned to the firing line is a chapter of absorbing interest. The new forms of warfare have added greatly to the difficulties of emergency aid. Wounded soldiers are forced to lie in the exposed places between trenches for hours and days; the problem of transportation to base hospitals is difficult of solution, and the uniformly infected character of the wounds makes the work of the surgeon arduous and discouraging. In spite of these handicaps a greater number of wounded soldiers are being cured and returned to the firing line sooner than in any previous war. The various hospital corps have attained great efficiency both in the treatment of the wounded and invalid and in rapid mobilization. Floating hospitals have been devised so as to secure more rapid mobilization and quicker service for the wounded, and prizes have been awarded to designers of motor ambulances more suitable under the present conditions.

The subject of hygiene of the soldiers is a large one. The trench fighting has made necessary certain changes in the uniform, and the fact that the war is being fought both in tropical and temperate zones indicates the wide variety of clothing needed. The footgear of the soldiers has received marked attention and changes have been made in the kind of shoes worn ever since the beginning of the war. Nor has the question of a proper ration been neglected. Considerable attention has been directed to this matter and interesting results have been observed. In order to prevent the spread of typhoid fever analysts and bacteriologists accompany the armies and examine all sources of drinking water for evidences of contamination. The experiences during the Spanish-American and Russo-Japanese wars have not been forgotten and it is probable that the freedom from disease enjoyed by the Japanese in the war will be excelled by at least some of the armies in the field. The emergency kit of the soldiers has been studied from all angles and changes made since the outbreak of the war have been productive already of good results. The insects and ecto-parasites which infest the soldiers and act as vectors for the transmission of disease have been carefully studied by no less an authority than Shipley.

In the realm of preventive medicine the use of antitoxins, vaccines and serums has been extensive. All German soldiers who have lately joined the active forces have received prophylactic injections against typhoid fever, smallpox and cholera. Some of the soldiers have been vaccinated against dysentery. The discovery of the supposed bacterial cause of typhus fever and a method of prophylaxis against that disease date since the war, but the work was done in America. Already a number of persons have been immunized against typhus fever and the present war affords a wonderful opportunity for testing the value of this agent. Anti-meningitis serum has been used extensively because of the outbreak of epidemic cerebrospinal meningitis among the Canadian and British forces and the English civil population. Vaccination against meningococcus infection has also been practiced, and the results of both these measures in a large number of cases will be interesting and instructive.

The necessity of a medical service and sanitary corps of ample numbers, proper equipment and especially with ample authority, has only recently been appreciated by military leaders. The experience of previous wars seemed to teach no lesson to military men, in spite of the huge losses due to the inroads of infection and disease. Even so late as the Spanish-American war,

86% of the total mortality among the American soldiers was due to typhoid fever. The statement made by a prominent medical man in England, that until this war no army possessed an efficient and well equipped sanitary service, is well within reason. No army of the future will be put in the field without an effective medical and sanitary service, of sufficient size and ample authority to give full protection to the health of the troops.

The subject of naval hygiene is full of interest, but unfortunately our information concerning the health of this branch of the service is very meagre. The health conditions of submarines is a subject for speculation. It would seem that the cramped and poorly ventilated quarters in these boats would predispose to respiratory diseases and press comment of doubtful authenticity has already hinted at the death of a number of seamen on these boats from pulmonary tuberculosis. The unvarying diet would predispose to conditions caused by a badly balanced ration. In addition exposure to various infectious diseases when calling at widely separated ports must be a factor of some importance. In our own navy the prevalence of venereal diseases has already created considerable comment.

Turning again to the army and civil population of the warring countries, the significance of the movement to reduce the consumption of beverages high in alcohol must be noted. Russia has forbidden the sale of vodka, or Russian whisky. In France the sale of absinthe is prohibited and in England the sentiment against alcoholic drinks is gradually gaining ground. In the German army only the lighter wines and beers are allowed. A study of the effects of this prohibition upon the active forces will be interesting. Among the civil population in Russia the effect has already been felt in the reduction of poverty which we have previously mentioned as a contributing cause of disease.

On the whole the present war presents many features of absorbing interest to all sanitarians. It is our duty to study all experiences and advances which are made in order to profit by the lessons taught by the war and fit ourselves for a more effective campaign against disease. Not only may the lessons learned be applied to maintaining the health and efficiency of our troops and seamen on active duty and on a peace footing, but many of them are applicable to the prevention of disease in civil life. In future articles a more detailed study of specific problems will be undertaken, such as the prevalence and prevention of typhus fever, cholera, dysentery and bubonic plague, the hygiene of the soldier, and military health administration. As the war continues into its second year more information concerning these subjects is becoming available, and an attempt will be made to render this series of articles of value and interest to all well informed health officials.

PUBLIC HEALTH NURSING SERVICE IN OHIO.

ROBERT G. PATERSON, PH. D.*

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What happens in your community when a case of communicable disease makes its appearance? If the disease occurs in a well-to-do family, the physician makes provision for a private nurse, promptly reports the case to the health officer and bends every energy to bring the patient back to health. There is scarcely anything for the health officer to do in the case. Isolation of the patient, quarantine of the house and disinfection become matters of routine. But if the disease occurs in a family of limited means or no means at all, the medical attention may or may not be the same as in the well-to-do family; no provision is made for nursing service other than that which may be given by a member of the family or a kindly disposed neighbor. The case may or may not be reported promptly to the health officer. When it is reported, the responsibility of the health officer becomes a grave one. Isolation of the patient may be difficult because of crowded living conditions in the home. Quarantine of the house may have to be enforced because of the ignorance of the family as to its purpose and disinfection may be resented.

Epidemics rarely, if ever, have their source in the homes of the well-to-do. They may be traced almost invariably to the homes of the poor, the careless, the ignorant, or the selfish. Most health officers know the strenuous measures that must be employed to break up an epidemic in a community. The measures that are to be employed to *prevent* an epidemic, once it is established, in a community are not so well known or so clearly realized. What are those measures?

First, a community well informed concerning the manner and means of the spread of communicable diseases.

Second, a community with a system for carrying this information into the homes regularly and consistently.

Third, a community with a system of detecting the slightest manifestation of a communicable disease in the homes and the yearly application of those measures which have been found efficient in breaking up epidemics.

Within the past few years, the State Board of Health has been placing great emphasis upon the value of education in public health work. The establishment of a Division of Public Health Education in the State Department of Health; the operation of a Public Health Exhibit; an increase in the supply of literature for free distribution and the employment of several public health nurses, indicate the several lines of endeavor which the State has taken up to assist in the educational campaign in the local communities over the State.

But the work which the State is doing must of necessity be general in nature, for the particular health problems in different communities are not always the same. It therefore becomes necessary for the local community

*Read before Conference of Health Officers, 1915.

to undertake a more specialized educational campaign and we believe that the very best method for doing this work lies in the employment of a local public health nurse.

That this method is finding increasing favor in the cities and counties of Ohio is attested by the history of the development of the work. Let us review this development for a moment.

The first public health nursing service in Ohio was that established by the Maternity Society of the Protestant Episcopal Church, of Cincinnati, in 1881. The society was formed for the purpose of providing the services of a physician and visiting nurse and supplying necessary aid and comfort to destitute women in childbirth. These services were given to all who needed them regardless of creed.

It was nine years before another service was established in Ohio, and again it was in Cincinnati, where Christ Hospital began visiting nursing work in 1890. This service was broader in scope, in that it sought to care for surgical, medical, obstetrical, contagious and tuberculosis cases.

In 1895 a visiting nurse department was established in connection with the Deaconess' Home, Cleveland, to care for surgical, medical, obstetrical and tuberculosis cases.

The Instructive District Nursing Association of Columbus was organized in 1898 to care for surgical, medical, obstetrical and tuberculosis cases.

In the period from 1900 to 1910 various kinds of specialized public health nursing services were established in Toledo, Dayton, Cleveland, Cincinnati, Youngstown, Canton and Columbus.

As will be seen from the above brief history, this service was confined to the larger centers of population in the state. The reason for this was sufficiently obvious to make further discussion unnecessary. Today, if we examine the public health nursing service in the larger cities, we will find it covers practically every form of specialized nursing. In Cleveland alone there are 132 public health nurses at work; Toledo has 33; Akron, 27; Columbus, 23; Dayton, 22; Cincinnati, 20; Youngstown, 8; Springfield, 5; Chillicothe, Hamilton and Canton, 2 each. This gives a total of 276 nurses in 11 cities employing two or more public health nurses. In addition there are 27 cities and 8 counties in which one nurse is employed, making a grand total for the state of 311 public health nurses.

At present there are twelve nurses employed by the State which are available for aiding local health officials to meet their problems. Five of these nurses are employed by the State Board of Health and seven by the Ohio Commission for the Blind.

Judging by the rapid development of the service during the past five years it is fair to assume that it is quite possible that the employment of public health nurses by local communities will be doubled within the near future. While it is true that the majority of these nurses are dealing mainly with tuberculosis, infant mortality, ophthalmia neonatorum and school inspection work, yet their services are available for practically any kind of public health work.

To indicate that these nurses are of practical value to the local health officer, we have taken the reports from three county nurses for the first six months of the year, i. e., from January 1 to July 1, 1915. These nurses are

working in the following counties: Lake, Tuscarawas, and Jefferson, and have been employed by those counties for about an average of two years:

NUMBER OF CASES AND VISITS, JANUARY TO JULY, 1915, IN THREE COUNTIES WITH COUNTY NURSE SERVICE.

NUMBER OF CASES AND VISITS, JANUARY-JULY, 1915, IN THREE COUNTIES WITH COUNTY NURSE SERVICE.

County.	Estimated Population 1915.	Sq. Land Area Miles.	Jan.		Feb.		Mar.		April.		May.		June.		Total.	
			C.	V.	C.	V.	C.	V.	C.	V.	C.	V.	C.	V.	C.	V.
Lake	23,577	241	28	163	20	112	43	162	48	157	21	112	75	180	235	880
Tuscarawas	58,789	555	45	104	52	106	52	119	48	102	41	99	48	116	286	640
Jefferson	76,532	407	19	100	21	120	14	88	30	96	21	80	21	86	126	569
Total	158,878	1,203	92	367	93	338	109	369	126	354	83	291	144	382	647	2,101

As has been said, these figures are for six months and for three nurses. Double the figures to make them represent one year's work and the grand total will be 1300 cases, 4200 visits. It seems to us that in these figures you have the answer to the question as to how to proceed in the prevention of disease.

The laws of the State provide that public health nurses may be employed by county commissioners and be paid their salary and necessary traveling expenses out of the county poor fund; that they may be employed by boards of education in cities for school inspection work; and we believe they may be employed by local boards of health and be paid out of funds provided for the work of the board of health, although a legal opinion would indicate otherwise.

None of these laws affect the health authorities directly but a recently enacted law has placed upon local health officers a responsibility in connection with the prevention of blindness which it may be well to examine closely at this time.

SECTION 1. Any inflammation, swelling or redness in either one or both eyes of any infant, either apart from or together with any unnatural discharge from the eye or eyes of such infant, independent of the nature of the infection, if any, occurring any time within two weeks after the birth of such infant, shall be known as "inflammation of the eyes of the new born."

SECTION 2. It shall be the duty of any physician, surgeon, obstetrician, midwife, nurse, maternity home or hospital of any nature; parent, relative and any persons attendant on or assisting in any way whatsoever, any infant or the mother of any infant at childbirth or any time, within two weeks after childbirth, knowing the condition, hereinabove defined, to exist, within six hours thereafter, to report such fact, as the State Board of Health shall direct, to the local health officer of the city, town, village or whatever other political division there may be, within which the infant or the mother of any such infant may reside. For such services the attending physician, surgeon, obstetrician, mid-

wife, nurse, maternity home or hospital shall receive from the state treasurer a fee of fifty cents.

SECTION 3. It shall be the duty of the local health officer:

1. To investigate or to have investigated, each case as filed with him in pursuance with the law, and any other such case as may come to his attention.
2. To report all cases of inflammation of the eyes of the new born and the result of all such investigation, as the State Board of Health shall direct.
3. To conform to such other rules and regulations as the State Board of Health shall promulgate for his further guidance.

The legislature has appropriated \$5,000.00 to the State Board of Health to carry out the provisions of this law, and the system by which the work will be done will be inaugurated within the near future, concerning which you will hear from us later by letter.

Now, if there was a nurse employed in your county, the matter of making an investigation under this law could readily be delegated by the health officer to such a nurse, thereby relieving the health officer of making the investigation, and at the same time securing an early determination as to whether nursing case was or was not required in the particular case.

We wish to urge, then, in conclusion, that every health official in the state, in counties where such nursing service is not now provided, make it a point to either see or write to their county commissioners urging the appointment of a public health nurse as provided by Section 3153-1 of the General Code. If the State Department of Health can be of service to you, either by appearing before your Board of Commissioners to urge the appointment of a nurse or by giving you information concerning the work now under way in the state, a letter to the Secretary and Executive Officer of the Board will secure the necessary assistance.

Health and education should go hand in hand and on the same plane; but while millions are devoted to education, only thousands are spared for health and it will ever be so unless the health officials themselves take the initiative in claiming a larger share of the funds for the development of plans for the prevention of disease.

THE QUARANTINE SITUATION.*

A General Review of the Subject as Affected by the World Prevalence of Cholera, Yellow Fever, Plague, and Typhus Fever.

L. E. COPER,

Assistant Surgeon General, United States Public Health Service.

When a quarantine officer inspects an arriving vessel his judgment of its sanitary status must be based upon two sets of conditions; first, conditions apparent at the time of inspection and second, the sanitary history of the port or ports of departure.

Under the first heading would naturally come (a) the presence of

*Reprinted from U. S. Public Health Reports, 1915.

quarantinable disease on board at the time of inspection; (b) during the voyage; (c) prior to departure from the foreign port; (d) the sanitary condition of the vessel; (e) the kind of cargo carried.

Under the second heading would come (a) the previous sanitary condition of the foreign port or ports and vicinity; (b) the recent sanitary history of the foreign port or ports and vicinity; (c) the measures carried out at the port of departure; (d) the type and nationality of the vessel.

It is not the purpose in this short review to discuss the relative importance of the above-mentioned factors in determining a vessel's sanitary status more than to say that there is no one factor as important as a knowledge of the sanitary history of the ports from which vessels have taken on cargo and passengers for United States ports. On this account the United States Public Health Service is endeavoring in every way possible to develop its system for the gathering of information in regard to health conditions in foreign ports, in order that no needless restrictions shall be imposed upon vessels, and, on the other hand, that active measures may be taken when necessary. Perhaps no review of world conditions affecting the diseases mentioned in the title would be complete without comparison with conditions prevailing in the year before that now to be discussed.

CHOLERA.

During the fiscal year ended June 30, 1914, cholera was present in Austria-Hungary, Ceylon, China, Dutch East Indies, Egypt, India, Philippine Islands, Russia, Siam, the Straits Settlements, Turkey in Asia, and Turkey in Europe.

With the exception of Turkey in Asia and Turkey in Europe, cholera was reported in the countries named above during the fiscal year ended June 30, 1915, and in addition to this, in the Balkan territory, Borneo, Germany, and Indo-China. It is interesting to note that while cholera was reported in eight places in Russia for the six months ending December 25, 1914, during the succeeding six months it was reported in only one place in that country, Petrograd, at which place cholera had not been reported during the previous six months. This fact illustrates the unreliability of reports from those ports of Europe affected by present conditions. However, with the amount of cholera reported in Russia during the six months ended December 25, 1914, and the absence of reports from that country, save from Petrograd, during the six months following, we may conclude that the disease was more or less widely prevalent, on account of the fact that during the six months ending June 25, 1915, cholera was reported to be present in prison camps in Germany, in 23 localities in Silesia, and in Brandenburg, Posen, and Zirka in Germany, all of which cases are probably traceable to the seat of war in the East.

The new infection in the Balkan territory has probably originated from the constant infection of Austria-Hungary, or reverse infection from Turkey, where cholera was reported prevalent during the fiscal years 1914 and 1915.

The cholera infection in the Balkan territory, as might have been expected, has been carried into Italy, the disease having been reported recently in and near Venice and Leghorn.

For the present, in any event, quarantine officers must watch travel from the Greek, Italian, and Holland ports with a view to the detection of either active cases of cholera, or, what is still more important, the detection of cholera carriers.

YELLOW FEVER.

During the fiscal year ended June 30, 1914, yellow fever was present in the following-named countries: Brazil, Ecuador, Mexico, South Nigeria, Trinidad, and Venezuela. During the fiscal year ended June 30, 1915, the disease prevailed in the above-mentioned countries with the following exceptions: Its disappearance from South Nigeria and Trinidad and its appearance in French Guiana. South America, as usual, appears to have furnished the largest number of cases of yellow fever.

The presence of the disease in Merida, Yucatan, has been of special concern to the Public Health Service, on account of the constant intercourse between Mexican ports and the southern ports of the United States. Owing to disturbed conditions in Mexico, the populations of the coastal towns have greatly increased on account of the influx of refugees, and the possibility of yellow fever occurring in epidemic form is constantly present. On this account the representatives of the service stationed in the offices of the American consuls in the various Mexican ports have proven of the greatest public health, as well as financial, advantage.

In addition to the presence of these officers in the Mexican ports during the summer quarantine season, a medical officer, expert in the diagnosis of yellow fever, personally visited all of the Mexican ports and a considerable part of the contiguous country, and upon his reports of actual conditions the quarantine requirements have been regulated and adjusted. Apparently the unprecedented lack of rain, with its effect upon mosquito propagation, has had much to do with the freedom of the Mexican ports in general from yellow fever.

The disease has persisted as usual at Guayaquil, Ecuador, and was present during the middle of the last fiscal year in Maracaibo and La Guayra, Venezuela.

PLAGUE.

History in regard to plague has repeated itself to a great extent, at least so far as the various maritime countries are concerned. There have been no unusual outbreaks of the disease, and in most instances, according to reports, the infection has been found in rats and has not affected man to any considerable extent. During the fiscal year ended June 30, 1914, plague was present in the following-named countries: Brazil, British East Africa, Ceylon, Chile, China, Cuba, Dutch East Indies, Ecuador, Egypt, German East Africa, Great Britain, Greece, Hawaii, India, Indo-China, Italy, Japan, Mauritius, Peru, Philippine Islands, Portugal, Russia, Senegal, Siam, Straits Settlements, Tripoli, Turkey in Asia, and Zanzibar.

This disease prevailed in all of the above-named countries in the fiscal year 1915 with the exception of British East Africa, German East Africa, Italy, Senegal, and Tripoli.

From the standpoint of the quarantine officer the presence of the disease in certain ports in close proximity to United States ports is deserving of constant attention. For example, plague has appeared in Terceira, Azores, from which point immigrants depart regularly for United States ports, via St. Michaels and Fayal. The disease has persisted in Cuba, in the cities of Habana and Santiago, and cases have been reported at Pinar del Rio and Guanabacoa. While there were nine cases of plague in Liverpool between August 8 and August 12, 1914, no cases of the disease were reported during the six months preceding the end of the last fiscal year, until August 27, when three plague-

infected rats were found in that port. It is reported that some measures are being carried out for rat eradication, followed by bacteriological examination. The disease is reported present in various localities in Greece, chiefly Piræus and Saloniki. In Turkey the presence of the disease at such places as Bagdad, Smyrna, Jaffa, and Beirut is of importance. Likewise is its presence at Alexandria and Port Said. As usual, the disease persisted in various Chinese ports during the year, among the most important cities affected being Amoy, Canton, Changchow, Chinchew, Fatshan, Hongkong, and Shanghai. The same may be said of the disease in India, the principal cities affected being Bombay, Calcutta, and Rangoon.

Of special importance to quarantine officers is the knowledge that the disease persists in South America, especially in the ports of Bahia, Pernambuco, and Rio de Janeiro, and in the inspection of vessels, even from clean ports, it is important that consideration be given to the connection which vessels might have with ports known to be infected. While the number of cases in Peru has not been great in any one locality, the disease was present in Callao, Lima, Arequipa, Ancachs, and La Libertad.

So far the effect of conditions in Europe on the transmission of plague has not been marked.

TYPHUS FEVER.

During the year this disease has appeared in the reports from Europe much more frequently than usual, and as a result it has been discovered in arriving immigrants and in those who have recently arrived. Cases have been reported in various cities and localities in the United States in persons who have associated with other persons recently arrived from Europe, and in some instances had apparently not associated with the latter. It is believed that were it possible to trace the infection in these cases, they would be found to be due to contact with unrecognized cases of typhus originating in some European country.

The disease has existed during the past year in Austria-Hungary in the cities of Vienna, Budapest, and Fiume, and also in certain localities in Bosnia-Herzegovina and Croatia-Slavonia. During the year in Austria-Hungary alone 5,589 cases were reported, and it is probable that there were many thousands of cases of the disease either unrecognized or unreported.

The presence of the disease in Austria-Hungary would account for its introduction into Germany, where amongst the German soldiers and prisoners of war 240 cases occurred between February 14 and May 8, 1915. In addition to these, cases were reported at Frankfurt-on-the-Main, Königsberg, and Lübeck.

For quarantine purposes the presence of the disease in Greece and Italy has caused special orders to be issued for the observance of care in the inspection of persons likely to have originated in the infected districts. Among the important cities of Greece in which typhus fever is present are Athens and Saloniki, and in Italy it was reported in Florence, Venice, and Turin.

In January, 1915, an epidemic of typhus occurred in Serbia, and at one time there were estimated to be between 500 and 1,000 deaths daily from the disease. Reports of its virulence and the fact that a number of physicians and nurses contracted the disease caused much comment in the daily press. The epidemic, however, has long since diminished, and the disease has apparently been under control during the last two or three months.

Reports as to the prevalence of typhus fever have come from Madrid and

Tarragona in Spain, Zurich and St. Gall in Switzerland, and Moscow, Odessa, Petrograd, and Warsaw in Russia.

The bureau has notified all Public Health Service officers engaged in quarantine and immigration duty, as far back as last March, to be on the lookout for passengers arriving from Greek and Italian ports who might be the means of bringing the disease into this country. A number of measures were instituted both at foreign ports and United States ports for the fumigation of baggage originating in Serbia and Greece, for the purpose of destroying vermin contained therein.

In addition to this, it should be stated that the force of service representatives, guards, etc., along the Mexico-Texas border has been increased on account of the prevalence of typhus fever at many places in Mexico and the danger of its introduction into Texas through refugees constantly crossing the border.

On the whole, it is thought that the quarantine situation today demands more careful attention from everyone concerned than it demanded in the past, so far as cholera, typhus fever, and plague are concerned; and with the cessation of hostilities in Europe there is every indication that the work and responsibilities of the quarantine system of the Public Health Service will be increased to an immeasurable degree. In the meantime it will be only by constant study of the information at hand regarding the world prevalence and geographic distribution of these diseases and the sanitary conditions in the countries of Europe that such deductions can be drawn as to the probable avenues of infection of this country as will guide quarantine officers at the ports of entry in the detection of the quarantinable diseases, even in the relatively few immigrants who are coming in daily by steamers from a number of different ports and who are capable of introducing infection.

THE PRACTICING PHYSICIAN.*

His Relation to Public Health Administration.

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The purpose of this paper is to bring to the attention of practicing physicians their relation to the work of local, state, and national health departments. It will be explained how it is impossible for the health department of a city, county, or state to perform the work for which it has been organized unless it has the cooperation of the practicing physician. It will be shown that even the health work of the National Government depends upon the assistance of the physician.

A principal function of the federal health department is the control of epidemics and the prevention of the spread of disease from one State to another. It is impossible for the National Government to prevent the spread

*Reprint — *Public Health Reports*, 1915.

of disease from State to State unless it knows in which States, and where in these States, the diseases it wishes to control are prevalent. It can not prevent the spread of these diseases without knowing where they are present. It must get this information from the several State health departments.

In turn the State health departments can not furnish to the National Government information of the prevalence of disease within their respective jurisdictions, nor can they control the spread of disease within their respective States, unless they know what diseases are present and where they are present. Now, the State health department can secure this information of the prevalence of diseases only from the practicing physician, either by requiring the occurrence of cases to be directly reported to it or by requiring such reports to be made to the local health departments of cities and counties and the local officials to furnish the information to the State.

Nor can the local health departments, city, county, or township, prevent the occurrence of disease or control communicable diseases in their respective jurisdictions without a knowledge of what diseases are present and where and under what conditions they are occurring. This information they can obtain only from the practicing physicians by requiring reports of the occurrence of cases of the diseases to be controlled.

Thus it will be seen that national control of disease, State control of disease, and municipal and county control of disease all depend upon the cooperation of the practicing physician. Public health administration for the city, the county, the State, and the country as a whole depends for its success upon the information as to the prevalence of disease obtained from physicians' reports of cases.

Our standard of living as a people is improving. Greater and greater consideration is being given to the conditions under which we live and work. We have come to realize that in any community the health and welfare of each individual and of each household depend in a large measure on the conditions of health and welfare of every other individual and of every other household.

In the complex life of modern civilization we can not individually protect ourselves from disease. The danger of infection from the sick and diseased whom we do not see and of whose existence we may be unaware may be greater than the danger from the sick among those immediately about us. We can protect ourselves from infection from the sick of whom we know, but we are in large measure helpless to protect ourselves from the disease of the sick of whose existence we are in ignorance. Every case of a communicable disease in a community is directly or indirectly a menace to every individual. The welfare of each depends upon the health of the community.

For a century or more there has been growing, at first slowly and in the last decade or two by leaps and bounds, an interest in social betterment. It is in a way a result of this movement that the part played by disease in determining the happiness, welfare, and efficiency of a community has been recognized. It has come to be realized that a community in which typhoid fever or malaria or any other disease prevails is a sick community and that a sick community is deprived of happiness and of efficiency to the extent to which it is sick.

Coincident with this period of growing social interest there has been a most unusual advance in the world's knowledge in many lines. There has been a great increase in knowledge, especially of the causes of disease and their

manner of spread. It has been definitely ascertained that a great many diseases, which for centuries have afflicted mankind, are preventable, and that while the statement of Pasteur that, "It is within the power of man to cause all infectious diseases to disappear from the earth" may be as yet only a theoretical ideal, it has been frequently demonstrated that it is entirely practicable to banish from a community certain diseases and to control and gradually reduce the number of cases of many other diseases. There are many diseases which the average community harbors merely because the inhabitants lack the initiative, energy, and desire to protect themselves from them.

The present movement for social betterment has manifested itself in a larger compensation for wage earners, in shorter hours for workingmen, in the protection of women and children from excessive hours of labor, in the improvement of housing conditions, in greater attention to recreation, in the education of the people in useful subjects, and in the prevention and control of disease.

The establishment of health departments has been a part of the general movement. The work of these departments is to control the controllable diseases, and they can properly have no other function. Many communities have attained the attitude of mind in which they are insisting that all diseases which it is possible to control shall be controlled. It is only a question of time and social progress when all communities will reach the same determination.

The work of health departments being the control of the controllable diseases, it is important to consider the things essential to this work. It is impossible for any health department, be its statutory powers and available appropriations never so great, to effectively control any disease without first having information as to whether the disease is present in the community, and, if present, how prevalent and where and under what conditions cases are occurring. The burning of punk in the streets, or the placing of mystic symbols over the doorway, or the mere appointment of a health officer, and the appropriation of money will not protect against disease. The control of disease is a work which requires definite information and knowledge of the occurrence of cases made use of by persons trained in epidemiology; that is, by persons having knowledge of the conditions which produce disease or cause its spread.

There are two main classes of controllable diseases at present recognized. These are communicable diseases and occupational diseases. The communicable diseases spread from individual to individual. Each case is a focus from which many persons may receive infection. Each focus is a potential epidemic. With but one or two exceptions every attempt at the control of communicable diseases other than by ascertaining the cases that occur, and the conditions under which they develop, has been a failure.

Occupational diseases are due to industrial environment and can be prevented only by ascertaining where conditions exist which are capable of producing them in workmen. Each case of an occupational disease shows where conditions of this kind exist, for the fact that a case has developed is conclusive evidence of the presence of conditions capable of producing the disease. To find where conditions exist which will produce these diseases it is, therefore, necessary to know of each case that occurs, and the time, place, and conditions under which it occurs.

For diseases due to improper living or housing conditions, an economic or social or educational readjustment is required. The degree of the burden laid

upon the community by the existence of such diseases and the need for a change in living or social conditions are also made manifest only by a knowledge of the cases of these diseases which occur and the conditions under which they occur.

The community is helpless to control any disease in the absence of definite knowledge of the conditions under which cases are occurring, and a health department which does not know of the prevalence of disease within its jurisdiction is a health department in name only.

As a rule the heads of health departments have been physicians. This has been so for the reason that the physician, because of his training, is the one most capable of recognizing cases of disease, and presumably knows their methods of spread and the means by which they may be controlled. There is no doubt that a man with a medical education has a better foundation upon which to build the special knowledge necessary to make an efficient health officer than one trained in other lines.

The work of the health officer, however, requires special knowledge of diseases and their prevention or control. At the present time the courses given by even our best medical schools furnish to the student but little opportunity to acquire any but the most superficial knowledge of the prevention and control of disease in its relation to the community. To so great an extent has this been true that it is quite probable that the advances made in public health administration in this country have been due as much to the demands of social workers for efficient health officers as to any influence which medical practitioners may have had.

The action taken during the last few years by a number of the largest medical schools in the country in providing courses in preventive medicine for the training of health officers has without doubt been in response as much to the demands of social workers and other nonmedical persons as to any influence which has come from the medical practitioner. This is not said in a spirit of criticism. It is only what one would naturally expect.

In a way the social worker can properly be expected to be more interested in, and have a more thorough understanding of, the need for the establishment of efficient health departments and the prevention of disease, than can the practicing physician. The practicing physician encounters disease in detail. He sees one case at a time. His interest is in the patient rather than in the community, and his energies are spent in attempting to relieve the patient from the physical burden of sickness. In doing this he seldom takes into consideration the source from which the disease was contracted and that the conditions which made his patient sick may still be operating to make others ill, nor does he always take into consideration in communicable diseases that his patient may be a menace to the community and endangering others. If he does recognize this he does not always feel his responsibilities in the matter. The thought which it is desired to express is that the practicing physician has his thought and attention focused on getting his patient well, and that the significance of the occurrence of a case of disease as it relates to the community in general seldom appeals to him.

On the other hand, the business of the social worker and public health worker is the bettering of the conditions under which man lives. To them the misery and sorrow caused by disease are apparent. The bearing of disease on poverty and of poverty on disease are daily seen. The sickness caused by faulty

industrial conditions is being constantly brought to their attention. In their daily work the need for the prevention of disease and the possibilities of its prevention are constantly before them. The social worker and health officer see the effect of disease on the community. The physician has to do with the disease of individuals, and although the physician may in many instances have a greater technical knowledge of the origin and effects of disease, his field of vision is narrowed by the nature of his calling.

The health department is established to cure the community of its diseases and to keep it well. The individual is significant to the health department only as his condition affects the community in general. The health department can properly have no function other than that of controlling disease in the community, and it is in this work that the practicing physician plays a vitally important part.

To control disease in the community the health department, as previously stated, must know when disease exists, where it exists, and under what conditions it occurs. To know this the health department must have a knowledge of the cases of controllable diseases as they occur. This knowledge of cases can be obtained only through the reports of the notifiable diseases made by physicians. The health department has no means of learning of the prevalence of disease other than the information obtained in this way. The health department does not go into the homes. It is not called upon to treat the sick as physicians are. Physicians are the only persons in the community who to any considerable extent come into contact with the sick and learn of the occurrence of disease.

Now, inasmuch as the health department can not do its work without information of the occurrence of cases of the controllable diseases and inasmuch as this information can be had only through the reports made by physicians of the occurrence of cases in their practice, the physician becomes an essential part of any scheme of public health administration. The practicing physician is essentially a part of the health department. This is true, whether the physician recognizes it or not, and whether the community recognizes it or not. The physician is the outpost, the picket that must give to the health department information of the approach of the enemy, his numerical strength, and his armament.

Cooperating with an efficient health officer the practicing physicians of a community have it within their power to make the efforts of the health department successful or to make their success impossible. So important is the control of disease to the welfare of the community, and so essential is the cooperation of the practicing physician through the reporting of cases, that it may be taken for granted that intelligent communities will bring about a satisfactory cooperation in this work between the physicians and the health department. It is only a question whether a public spirited, humanitarian medical profession will take the initiative and voluntarily and cheerfully accept and carry out its responsibilities, as it undoubtedly will. Any other course is inconceivable. Certainly upon the attitude of the medical profession in this matter will largely depend its relations to the community in the future.

The practicing physician who fails to report a case of a communicable disease thereby endangers the welfare of the community and exposes others to the danger of contracting the disease, and among those thus exposed may be others of his patients. He is neither a good physician nor a good citizen, and

must be considered as opposed to the principle of the control of disease and the protection of the community for which the health department stands.

With the help and cooperation of the practicing physician the health department can do much to prove the truth of Pasteur's statement that it is within the power of man to cause all infectious diseases to disappear. Without the cooperation of the practicing physician the health department can do but little.

FOOT STRAIN—AN OCCUPATIONAL DISEASE AMONG NURSES.

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The trained nurse has many troubles with which to contend, in the form of long hours—exacting patients—serious cases demanding constant mental and physical attention, fatigue—loss of sleep and irregular hours of rest and recreation.

The nurse in private practice has to contend with the above troubles far more than her sister, employed in an institution or hospital, where her hours are regular and when off duty she can seek any form of rest and recreation she desires. The nurse in the hospital is free from excessive demands upon her physical strength, yet under some conditions she may face a problem which may possibly compel her to give up her vocation, unless it be completely solved.

Nursing demands that the girl be upon her feet to a very great degree. If she be heavily built, have improper shoes or be careless in her standing, it is quite probable she will suffer with weak feet to a greater or less degree. Should she work upon a wooden or linoleum floor—or one covered with some elastic material, her feet may cause little trouble. On the other hand, should she have to work upon a tile, cement, or stone floor, the probabilities are that in spite of various forms of foot gear her feet may cause a vast amount of annoyance and trouble.

The Cincinnati General Hospital is composed of the most fire resisting material throughout. All floors are tile, and walks and stairs of cement or mosaic. None of them soft or elastic material; but material made to wear, resist fire and be easily kept clean. The floors are hard,—unyielding, inelastic, and because of these qualities have caused considerable complaint among the nurses.

The hospital just completed was occupied late in February, 1915. The nurses work in eight-hour shifts. During the following months complaints as to pain in feet and ankles, unusual fatigue in the legs, cramps in the calves of the legs, with marked stiffness, became common, and some of the nurses had to report off duty as time progressed.

This condition seemed to point to an occupational disease and investigation disclosed a high percentage of nurses complaining in greater or less degree.

According to length of service and training the nurses are divided into various classes:

- (a) *Probationers* — Girls on probation. They must serve two months and prove themselves fit to be accepted as nurses in training.
- (b) *Freshmen* — Girls in the first year of training.
- (c) *Juniors* — Girls in the second year of training.
- (d) *Seniors* — Girls in the third year of training.

(e) *Head Nurses* — Nurses who have completed three years' training are graduated — but remain as Head Nurses in charge of a ward, and supervise the training and work of the classes under them.

A census of these various grades disclosed a rather interesting condition, tabulated as follows:

<i>Probationers:</i>			
Number	Investigated.....	25	
Number	Complaining.....		7
Percent	Complaining.....		28
<i>Freshmen:</i>			
Number	Investigated.....	20	
Number	Complaining.....		8
Percent	Complaining.....		40
<i>Juniors:</i>			
Number	Investigated.....	18	
Number	Complaining.....		9
Percent	Complaining.....		50
<i>Seniors:</i>			
Number	Investigated.....	30	
Number	Complaining.....		10
Percent	Complaining.....		33
<i>Head Nurses:</i>			
Number	Investigated.....	35	
Number	Complaining.....		10
Percent	Complaining.....		28

These figures were secured during the past summer. Vacations may possibly have cut some slight figure in securing exact returns. The personal element may also have entered, as though most of the nurses answered frankly; it is probable that some (especially the probationers), fearing they might not be accepted, concealed the true state of their feet.

One girl in the Junior Class had to give up her training entirely.

An occupation having such a high percentage of partial incapacity is one demanding remedy, if possible. This, however, is a very large problem which must be approached intelligently and deliberately.

The shoeing question is possibly first. Various types of "straight last" shoes have been used. The Anatomic, True Tread, Orthopedic-Ground Gripper all being tried, in some instances with success, in others with failure. Frequently one type of shoe may prove successful where another fails, but occasionally all fail. Tennis shoes — rubber heels — prove of service and frequently the alternate wearing of these and a "straight last" leather shoe has proven most successful.

Strapping the feet with surgeons' adhesive plaster in some cases is very efficient, especially when used in connection with intelligently directed exercise — position of standing and some type of shoe. Yet once all measures failed and the girl had to give up her training.

One might help these conditions by the use of some elastic floor covering — a wooden lattice or a runner extending down the middle of the ward, but when such an enormous floor area must be covered probably the solving of each individual girl's ills may give the best results.

Certain it is that no girl should be accepted for a nurse's training who has had any foot strain, and all candidates presenting themselves should be subject to a medical examination. Any one applying for enlistment in the Army or Navy is examined for "flat feet." A similar examination for those wishing to take up trained nursing would eliminate a number of the unfit and raise the efficiency of the entire personnel.

A SURVEY OF INDUSTRIAL HEALTH-HAZARDS AND OCCUPATIONAL DISEASES IN OHIO.

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(Continued from the August issue.)

MALT LIQUORS (BREWING).

The Census gives 105 establishments engaged in this industry, employing 4,356 wage-earners, or 1.0% of the total wage-earners in the state. Our investigations covered 11 establishments, in 3 cities, employing a total of 1,055 wage-earners, all males. The chief processes of health-hazardous character were found to be: Brewing, Bottling, Keg Filling, Washing, and Ice Manufacturing.

The following is abstracted from an Editorial in The Brewery Workers' Journal, January 17, 1914:

Our Dead in 1913. The number of deaths occurring among the members of our International Union for the year 1913 is considerably higher than in the year previous. The cause for this seemingly unfavorable condition is the fact that last year those local secretaries who formerly did not pay close attention to their duties, have sent in their death notices more promptly. So for the first time since these statistics are published it can be said that the figures given below are as nearly correct as possible.

Reports of 732 deaths were received from 179 local unions with an average membership during the year of 42,218. The death rate is accordingly 17.34 per thousand, or 3.11 per thousand higher than in 1912, where 180 local unions with a membership of 40,895 reported 581 deaths, or 14.23 per thousand.

The six leading causes of death during 1913 were: Consumption, accident, pneumonia and bronchitis, heart disease, cancer and liver and kidney trouble. Then follow suicide, dropsy, stomach trouble, paralysis, heat, appendicitis, rheumatism, murder and old age, in the order named. In the following tables the figures given in parenthesis are those for 1912.

Of the 732 deaths reported, there were caused by:

Consumption	167—22.81%	(124—21.34%)
Accident	89—12.16%	(78—13.43%)
Pneumonia and Bronchitis.....	87—11.88%	(50—8.81%)
Heart Disease	73—10.00%	(78—13.43%)
Cancer	39—5.33%	(17—2.92%)
Liver and Kidney Complaint.....	35—4.78%	(34—5.85%)
Suicide	30—4.10%	(28—4.82%)
Dropsy	29—3.96%	(25—4.30%)
Stomach Trouble	21—2.87%	(11—1.89%)
Paralysis	19—2.59%	(20—3.44%)
Heat	5—0.68%	(4—0.69%)
Appendicitis	5—0.68%	(4—0.69%)
Rheumatism	5—0.68%	(9—1.55%)
Murder	3—0.41%	(2—0.34%)
Old Age	2—0.27%	(3—0.53%)
Miscellaneous Diseases	87—11.88%	(73—12.56%)
Cause of Death not given in report.....	36—4.92%	(21—3.61%)

There died at the age of:

Under 20 years.....	7—0.96%	(2—0.34%)
Between 20 and 30 years.....	79—10.79%	(59—10.16%)
Between 30 and 40 years.....	141—19.26%	(124—21.34%)
Between 40 and 50 years.....	243—33.20%	(197—33.90%)
Between 50 and 60 years.....	192—26.23%	(133—22.89%)
Over 60 years.....	62—8.47%	(49—8.44%)
Age not given in report.....	8—1.09%	(17—2.93%)

The deceased were of the following descent:

German	430	(369)
Irish	109	(65)
American	103	(62)
Austrian	14	(10)
Swiss	10	(8)
Bohemian	10	(13)
All others	56	(50)

Rheumatism caused the death of five members—three brewers, one bottler and one laborer. Five members succumbed to excessive heat—one brewer, one bottler, one driver, one fireman and one cooper.

The percentage of the three most numerous categories of brewery workers participating in the six leading causes of death during last year is as follows:

Of the 246 deaths among brewers, 166, or 67.46%, were caused by—

Consumption	59—23.98%	(35—17.00%)
Accident	32—13.00%	(25—12.12%)
Cancer	23—9.35%	(.. .. .)
Pneumonia	22—8.94%	(19—9.23%)
Heart Disease	22—8.94%	(37—17.96%)
Liver and Kidney Complaint.....	8—3.25%	(10—4.86%)

Of the 212 deaths among drivers, 150, or 70.75%, were caused by—

Consumption	46—21.70%	(33—18.96%)
Accident	31—14.62%	(32—18.89%)
Pneumonia	30—14.15%	(16— 9.20%)
Heart Disease	23—10.85%	(18—10.34%)
Liver and Kidney Complaint.....	15— 7.08%	(10— 5.75%)
Cancer	5— 2.35%	(.. ..)

Of the 125 deaths among bottlers, 79, or 63.20%, were caused by—

Consumption	28—22.40%	(29—31.52%)
Pneumonia	14—11.20%	(10—10.87%)
Heart Disease	14—11.20%	(10—10.87%)
Accidents	11— 8.80%	(5— 5.43%)
Liver and Kidney Complaint.....	8— 6.40%	(5— 5.43%)
Cancer	4— 3.20%	(.. ..)

While in 1912 dropsy was among the six leading causes of death, in 1913 cancer was more frequent. The order of the ten most frequent causes of death are as follows: Consumption, in 1913, 1 (in 1912, 1; accident, 2 (2); pneumonia, 3 (4); heart disease, 4 (3); cancer, 5 (9); liver and kidney complaint, 6 (5); suicide, 7 (6); dropsy, 8 (7); stomach trouble, 9 (10); paralysis, 10 (8).

SOAP MANUFACTURING.

The Census gives 44 establishments engaged in this industry, employing 1,774 wage-earners, or 0.4% of the total wage-earners in the state. Our investigations covered 12 establishments, in 3 cities, employing a total of 2,020 wage-earners, of whom 1,578 were males and 442 were females. The chief processes of health-hazardous character were found to be: Soap Manufacturing and By-Products, Mixing Chemicals, Oil Refining, some specialty processes as well as Machine Shopping, Wood-working, Printing and Labeling.

WIRE AND WIRE WORK.

The Census gives 66 establishments engaged in this industry, but does not state the number of wage-earners. Our investigations covered 6 establishments, in 4 cities, employing a total of 1,972 wage-earners, of whom 1,908 were males and 64 were females. Of these plants 2 were engaged in the manufacture of wire and 4 in wire products. The chief processes of health-hazardous character were found to be: Furnacing, Hot Shaping, Wire Drawing, Fluxing (Flour-Water Vats), Pickling, Tinning, Electroplating, Galvanizing, Painting, Iron Founding, Brass Founding, Machine Shopping, and Wood-working. (See also Foundry and Machine Shop Produces.)

INDUSTRIES IN WHICH THERE IS A LIABILITY TO CONTRACTING COMMUNICABLE OR INFECTIOUS DISEASES.

It is impossible to attempt to cover all of the relations between communicable diseases and industry, or even to touch upon all of the most important.

We give in this place the results of some special studies and some casual observations which have been made in the State during the period of this survey.

INDUSTRIAL TUBERCULOSIS.

(Reprinted from Monthly Bulletin, Ohio State Board of Health, April, 1914.)

Industrial tuberculosis is a term which is being used to associate the occupation of an adult person as a distinct factor in the causation of his or her consumption. In the propaganda against the great white plague, every effort conceivable is being directed toward the bettering of housing and living conditions, the correction of habits and the elimination of moral hazards. Almost to the present time little constructive thought has been given to the 10 hours or so which the individual spends in occupational pursuit. If foul air, abnormal humidity, fatigue, inactivity, poisons, etc., predispose to tuberculosis between 6:00 P. M. and 6:00 A. M., must they not also during the day when heat and dust are also added, and respiration and other vital processes are much accentuated?

This situation is remarkable, for a little investigation shows that where the factors at which the propagandists are chiefly aiming remain constant, and perhaps excellent, workers in certain pursuits succumb to tuberculosis in numbers suggesting a black plague. For example, professional men, men and women in agricultural pursuits, millers, quarrymen and carpenters have a death rate from consumption, which according to statistics, lies between 6.6% and 10.1%. On the other hand, clerks, book-keepers, telephone girls, stenographers, teachers, textile-workers, tobacco-, glass-, brass-, rubber-, and pottery-workers, printers, stone-cutters and the like, range between 19 and 43%.

In our present concept, tuberculosis is due to—

(1) The presence of the *Bacillus Tuberculosis*. Carelessness makes it almost omnipresent.

(2) Predisposition, which covers heredity and congenital defects.

(3) Infantile and early childhood infection, when the disease is highly communicable, but deaths are comparatively few.

(4) Health hazards, which customs, ignorance and bravado suddenly magnify during the youth of both sexes, and which so lower the resistance as to re-awaken the childhood infection or invite—

(5) Adult infection. This seems only possible when damaged lung tissues receive a constant infection through the air.

By all means (1), (3) and (4) are the mighty factors. With industry we find that although the vast majority of persons have received their infection during infancy and childhood (perhaps 90%), the factor (4), which begins

with, and is so infinitely bound up with industry, to which may, perhaps, be added (5) — so often due to over-crowding in industrial places, the lack of cuspidors, and the presence of the consumptive spitter—these two explain why the girl who remains at home, or the man who follows a fresh air industry, as in the quarry, are comparatively immune, whereas the sister and brother in the office, factory or mill appear to be shorn of resistance.



FIG. 33. INDUSTRIAL TUBERCULOSIS.

Middle-aged skilled workman incapacitated by consumption, the chief promoting factors being dust and fumes in his work.

ILLUSTRATION OF WHAT IS MEANT BY INDUSTRIAL TUBERCULOSIS.

(Reprinted from Monthly Bulletin, Ohio State Board of Health, September, 1914.)

We give below the results of a routine investigation of a plant according to the outline of industrial health-hazards as published in the April issue of this BULLETIN. After a perusal of the findings given, which are those of an actual case, is there any wonder that six cases of consumption have been reported to the State Board of Health within a few months' period among the workers in this establishment!

<i>Features.</i>	<i>Health-Hazards.</i>
Establishment	X.
Location	C.
Industry	Woodworking.
Employees	390 men, 50 youths under 20.
Modern methods	Fairly so.
Unionism	Open Shop.
Attitude toward workers.....	Indifferent.
Type of workers.....	Largely ignorant foreigners.
Retention of workers.....	Not good.
Health appliances	A blower system, but not kept in working order.
Health instructions to employees.....	None.
Sick benefits, etc	None.
Death benefits	Small order, maintained by employees.
Work hours	10 per day, one-half hour noon, no other recesses.
Overtime	Occasional.
Number of skilled workmen.....	Only small per cent.
Age groups	Under 20—50; 20 to 40—310; over 40—30.
Construction of building.....	Old factory type, low ceilings, many dark quarters.
Workers at one process exposed to hazards of another.....	About 100.
Dust	Wood dust, air thick with it.
Dirt	Floor, walls and windows apparently rarely cleaned.
Dampness	No.
Darkness	Three-fourths of workers are in poorly lighted quarters.
Air	Still, close, stuffy.
Heat	No factor.
Cold	No factor.
Fatigue	Fair amount due to piece work, speeding up, constant standing, faulty postures, jarring processes, body pressures and loud noises.
Inactivity	Negative.
Infection	Great liability due to crowding, use of common cups, towels, improper washing places and closets, spitting on floors, absence of cuspidors, frequent trivial injuries, no selection of workers, no physical examination, no medical supervision.

<i>Features.</i>	<i>Health-Hazards.</i>
Poisons	Negative.
Alcoholism inducement	Great, due to poor quality and meager supply of drinking water, to proximity of saloons, heedlessness of employer, absence of workers' efficiency department, and to subjection to dust, dirt, darkness, bad air and fatigue.
Workmen's complaints	Chiefly, constant breathing of dust, compelled to work alongside of men who are consumptive and careless in habits.
Diseases reported to State Board of Health	SIX CASES of consumption within a period of 4 months time.

Two dangerous health-hazards should be abolished at once in this establishment. The first is wood dust, which, though the plant is fairly well equipped with blower systems, is allowed to escape into the air because it is nobody's business in the plant to see that the blower systems are in continual working order. The second great hazard is the lack of a medical supervision of the employes to root out the consumptives who are still at work with no cuspidors in which to spit out their tubercular sputum. There are some other health-hazards which should have attention, but these constitute the major ones.

TRACHOMA OR GRANULATED EYELIDS.

The following is taken from an editorial in the Jour. A. M. A., May 16, 1914, page 1564, while the "Conclusions" and "Recommendations" are taken from the original article in Public Health Reports, Vol. 29, No. 10, March 26, 1914:

"During the past few years reports regarding trachoma among the reservation Indians and the mountain population of Kentucky and other states have stimulated interest in this disease. Investigation has shown that it affects many communities, to a greater or less extent, existing in a number of instances among school children. Attention has been directed to the great industrial establishments where large numbers of foreign laborers are employed. In each instance, when a focus of the disease has been found, its origin has been carefully investigated so that preventive measures might be instituted. J. W. Schereschewsky of the Public Health Service has examined the 5,962 employes of the Youngstown (Ohio) Sheet & Tube Company with reference to the prevalence of trachoma. He found among them seventy-six cases, a rate of prevalence of 1.3 per cent. Nineteen cases of suspicious conjunctivitis were also observed. Of the employes 28.5 per cent were Americans. Among the 1,700 Americans the rate of prevalence was 0.23 per cent. and among the seven foreign nations represented the rate ranged from 0.9 to 3.0. After careful inquiry as to the time these men had been in the United States, Schereschewsky expresses the opinion that with but few exceptions the disease was contracted subsequent to landing in this country, and in the great majority

of instances while the men were employed in East Youngstown. It was not thought that the disease had been spread to any great extent by conditions in the mills. Close physical contact and the use of the common towel and hand basin are known to be favorable to the spread of trachoma, but these conditions do not prevail in the works of the company. Most of the foreigners do not wash in the mills, and those Americans of the skilled labor class who do, have their own buckets or vessels and towels. One possible source of infection in the mills is the habit of the workmen of removing from each



FIG. 34. GRANULATED EYELIDS.

Partial blindness due to trachoma or granulated eyelids—a disease easily spread by common towels, also by allowing a worker having the disease to attempt to remove a foreign body from the eye of a fellow-worker.

other's eyes foreign bodies that may lodge therein, although they are instructed to apply to the medical service for relief. Attention was directed to the living conditions of the workers, and here Schereschewsky discovered the chief source of infection. Many of the lodging-houses of the workers were much overcrowded. Thus, in one instance twenty-three lodgers were found in a four-room house, as many as ten or twelve in one room. Insanitary conditions prevailed in East Youngstown as well as in the immediate surroundings of the men. The presence of recent cases of the disease was gradually spreading

from foci of chronic cases in a state of acute exacerbation, some of which Schereschewsky observed. In most instances, perhaps, as at East Youngstown, the cases are among laborers from foreign countries who have been in the United State a comparatively short time. The inspection at the ports of entry serves to detect practically all cases that have reached a stage at which diagnosis is possible; an immigrant when he lands may have the infection in such an undeveloped state that it cannot be detected and he may then in a short time become a focus for the spread of the disease. The employers of labor in the great industrial establishments should be warned of the seriousness of trachoma, and especially of its liability to spread. The health authorities of the cities and towns where these establishments are located should realize their responsibility in this matter. Bad housing, overcrowding and lax personal and community hygiene will contribute to the spread of this highly infectious and disabling but wholly preventable disease.

CONCLUSIONS.

1. The origin of the prevalence of trachoma among the employees of the Youngstown Sheet & Tube Co. is readily accounted for by the presence among them of chronic cases of the disease, some of which are even now in a state of acute exacerbation.

2. The crowded insanitary condition of the lodging houses, where a large proportion of the employees live, amply accounts for the spread of the disease.

3. The presence of recent cases of trachomatous infection shows that under existing conditions the disease is gradually being spread. Unless measures are now undertaken for its control the prediction seems justified that the disease will gradually gain such headway as perhaps to prevail in epidemic form.

4. It seems evident that so long as the present insanitary conditions obtain in East Youngstown the control of trachoma will be difficult or impossible unless measures to this end go hand in hand with betterment in the local sanitary conditions.

5. The present machinery for the control of the situation is unsatisfactory. The local health officer of East Youngstown is a layman, without the knowledge or training in sanitation to enable him to cope with the situation.

The town itself lacks completely the fundamentals for sanitation, namely, a public water supply, water carriage sewerage system, system of garbage collection and disposal, physical supervision of school children, proper grading of streets, and provision for the disposal of the surface washings and storm waters, even the numbering of houses, so that the location of cases of communicable diseases can be recorded. There are also no local dispensaries or hospitals, except the emergency hospital of the Youngstown Sheet & Tube Co., which is located in the plant.

RECOMMENDATIONS.

In view of the fact that some 80 per cent of the taxes of East Youngstown are paid by the Youngstown Sheet & Tube Co., and that 60 to 70 per cent of their personnel, including nearly all the foreign element, live in East Youngstown, it would seem as though the Youngstown company is more directly interested in the sanitary conditions in East Youngstown than anyone else.

The efficiency of its employes is affected, not only by their environment when at work but also by that of their homes. It is evident that when workmen are exposed to insanitary surroundings during their period of rest, not only do they incur the danger of contracting communicable diseases but their ability to recuperate from their previous labor is adversely affected by the prevailing unhealthful conditions.

Any effective treatment of the situation must necessarily include specific measures to be adopted at the mills and also the betterment of the sanitary conditions in East Youngstown if permanent results are to be secured.

The recommendations made, therefore, related to two separate ends; first, the treatment of the situation at the mills and, second, the sanitation of East Youngstown.

Besides calling the attention of the company to the usual means for preventing trachoma, such as avoiding the use of the common towel and hand basin and the use of the same bed by two or more individuals, the following special recommendations were made for the company to put into effect at once:

1. No time should be lost in securing a competent physician on full time, at an adequate compensation, who should perform the following duties:

- (a) Make a complete mental and physical examination of persons applying for employment with the company.

- (b) Give competent treatment to any individuals found to be afflicted with trachoma or other communicable diseases.

- (c) If the necessary arrangements could be made this physician could also be the health officer for East Youngstown and supervise its sanitary condition.

2. A competent graduate trained nurse should be secured who would be able to administer treatment to trachoma cases under this physician's direction.

3. All individuals named in a list furnished the company who are suffering from trachoma, and with respect to whom the notation "acute," "recent," or "severe" was made, should be segregated, preferably in some building controlled by the company, and there furnished competent medical treatment until such time as the infectiousness of the disease has been removed. They could then be allowed to return to work conditionally upon their reporting daily to the hospital for inspection and treatment.

4. All persons suffering from trachoma, including those segregated in the manner just referred to, should, upon their return to work, be required to report for inspection and treatment twice daily at the hospital. It was suggested, in order to secure easy compliance with this recommendation, that these persons secure their time cards at the hospital and the fact of their having there reported, on going in and out, be attested by a special stamp kept at the hospital.

5. In order to prevent the development of subsequent cases, foremen, or those in charge of gangs, should be required to submit semi-weekly reports as to the appearance of the eyes of men under their control. Such reports should not be perfunctory, but should state affirmatively or negatively whether they have observed any cases of reddened or sore eyes in any of the men under their charge. Whenever the eyes of any workmen appear red or sore such workmen should be sent at once to the hospital for examination.

The following recommendations as to the improvement of the sanitary conditions of East Youngstown were made, their realization to constitute part

of the future policy of the company, as an equivalent for the large taxes paid by the corporation:

1. The provision of an adequate and pure water supply.
2. The installation of a water-carriage sewer system.
3. The abolition of insanitary privies.
4. The installation of catch basins and sewers for disposal of storm waters.
5. The installation of a system of garbage collection and disposal, with ordinances as to the use of sanitary garbage cans with tight-fitting covers.
6. Restriction of overcrowding in lodging houses and regulation of their sanitary condition by a system of licensing and inspection.
7. Numbering of houses and grading of streets.
8. Physical supervision of the children in the schools.
9. The appointment of a properly qualified physician as health officer.
10. Establishment of a hospital and dispensary in East Youngstown.

[NOTE.—It is gratifying to learn from a letter received from Mr. Woltz, the director of safety of the Youngstown Sheet & Tube Co., that the recommendations in regard to the treatment of trachoma cases have already been carried into effect.]”

(To be continued.)

THE HYGIENE OF SPECIAL PROCESSES.

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(Continued from the August issue.)

LAUNDRY, — LISTING, SORTING AND MARKING.

This process was investigated in 7 places employing a total of 142 employes, 14 of whom were males and 128 females. Of the total number, 134 were between 20 and 40 years of age. The health-hazards were exposure to *humidity* and *dampness* (due to other processes) in 4 places; dark, close and *unventilated* quarters in 3 places; standing and monotonous character of the work, and nauseating odors from soiled clothing. The liability to the contraction of *communicable* diseases from the handling of soiled clothing and linen is of course present, but is a much disputed point in actual fact. In this connection it will first be necessary to have sick records kept of at least several hundred of such employes over at least a year's time before conclusions can be reached. On the other hand, eating in the work room, meagre washing facilities, the use of common towels and common drinking cups, were features in 3 of the 7 places. The general character of the work also would appear to make it inadvisable to employ both males and females at it together. The appearance of the workers was generally good in 2 places, and fair only in the remaining 5 places. The workers made no complaints.

LAUNDRY, — WASHING.

This process was investigated in 19 laundries, all of the character using machinery to a large extent. It was also investigated in such places as dry cleaning establishments, and in some large firms who performed their own laundry work—the general features being similar to what is here described. It is recognized that some work must necessarily be done by hand. The total number of employes was 241, of whom 118 were males and 123 were females. For the work undertaken the methods were modern in 12 places, fairly so in 3, and not so in the remaining 4. No union organizations existed. The general attitude towards employes was good in 11 places, fair in 6, and poor in 2. Employes were of an intelligent type in 13 places, fairly so in 4 more, and ignorant foreigners in the remaining 2. Retention seemed good in 13 places, fairly so in 3, and not so in the remaining 3. Health appliances, consisting of exhaust apparatus over operations, and, when needed, special room ventilation apparatus, were fair to good in 11 places, and absent in the remaining 8. In 4 places health placards, etc., were found present. In no places were there sick benefit organizations. The construction of work quarters was hygienically good in 10 places, fair in 2, and not so in the remaining 7. Other processes than washing were present in 8 places. The work was unskilled. There were found to be 2 employes over 40 years of age, 214 between 20 and 40, and 25 under 20.

Uncleanly quarters were noted in 5 places, and especially so in 2. General room *humidity*, wet floors, and steam, were negligible factors in 4 places, fairly so in 3, and bad in the 12 remaining. In some of these, attempts made to better the conditions were quite inefficient. *Light* was good in 14 and bad in 5 places. The *workroom ventilation* was good in 5 places, and not so in the remaining 14. Several depended solely upon windows for ventilation. *Heat* was no hazard in 9 places, fairly so in 9 others, and bad in the remaining 1. In some places it ranged from 80 to 90 degrees, which, combined with humidity, rendered it especially deleterious. Washing facilities, such as shower baths, were absent in all but 2 places, although other types were good in 7 places, fair in 7, and poor in the remaining. *Fatigue* was some factor and due principally to monotony, hurrying, constant standing, faulty postures and constant rapid movements. In some places were excellent rest rooms and lunch rooms where coffee was furnished at the noon hour. The workday was 8½ hours in 1 place, and from 9 to 10 in the balance. The noon recess was 1 hour in 5 places and ½ hour in the remaining 14. The liability to the contraction of *communicable diseases* was negligible in 7 places, fairly so in 8 others, and considerable in 4, due to such features as promiscuous spitting, absence of cuspidors, the use of common towels and drinking cups, inadequate wash places, poor toilets, work clothes hanging in the same room, and the absence of medical supervision to keep out frail and diseased workers. *Poisoning*, due to the effects of bleaching powder and of sodium carbonate, appeared some risk in a very few places, although no cases were found. Bleaching by electricity (a harmless process) was in vogue in some places. On the other hand nauseating *odors*, due both to piles of dirty clothes and washing odors, were fairly frequent. Escaping unburned gas fumes, usually from other processes, were present in some places. The inducement to *stimulantism* was a fair hazard in the majority of places, due to the depressing influences of various combinations of the hazards above mentioned.

The general *appearance* of workers was good in 13 places, and fair to bad in the remaining 6, where many were in need of physical examinations to determine their health status. *Complaints* on the part of the workers were surprisingly few and pertained to heat principally, and fatigue secondarily. *Comments*.—Air conditioning systems to supply cool air in summer and warm air in winter, with means of removing humidity, as by suction fans or hoods, are urgently needed in many places. In addition, good floor drains, impervious aprons or clothing, proper shoes or boots, variations at process so that females in particular need not stand constantly, adequate wash facilities (even to shower baths), a proper place to hang street clothing outside of the wash room, and the separation of the washing process from other processes, are chief corrective features. Again, a careful record should be kept of all sickness and its character.

LAUNDRY. — MANGLING.

This process consists in taking flat work, as a rule, which has just come from the washing machines and extractors and passing it through cylinders which are heated by steam pipes or electricity. While the central cylinder exposes an iron surface the others are usually covered with felt. The workers stand on raised platforms at the large mangles, while they may sit down at the smaller ones. Feeders introduce the goods into the rolls while folders on the opposite side of the machine remove them.

The process was investigated in 15 plants employing a total of 362 wage-earners of whom 22 were males and 340 were females. The work, although unskilled, engaged a fairly intelligent type of workers in two-thirds of the places. There were no union organizations. The retention of the workers was good in 12 places and at least fair in the remaining. The attitude towards workers seemed excellent in 9 places, good in 4 more, and not so in the remaining 2. Some instructions along health lines were found in 2 places. There were no sick benefit organizations. Health appliances (see below) were good in 9 places, fair in 2, and absent or inefficient in the remaining 4. The general construction of work quarters was good in 6 places, fair in 6 more, and poor in the remaining 3. Other processes, such as washing, ironing, marking and sorting, were present in the same room in 9 places. There were 16 persons over 40 years of age, and about 25 under 20 years of age.

Steam, humidity and *dampness* were negligible in 6 places, fairly so in 4 more, and bad in the remaining 5. In some places this was as much due to the washing processes present as escape of steam from the mangles themselves. In 3 places quarters were unduly *dark*. General room *ventilation* was good in 5 places, fair in 5 more, and poor in the remaining 5, due to the lack of air exchange and the contaminations from the processes present. The room *temperature* was good in 3 places, fairly hot in 8 more, and unduly so in the remaining 4. In about the same proportion washup facilities were meagre, while here and there toilets were located at a distance and were only reached through cold passage ways. *Fatigue* was a bad feature in 1 place, fairly so in 8 more, and negligible in the remaining 6. The chief features were constant standing and monotonous work, particularly in the case of young girls. Piece-work was noted in but 1 place. The awkward postures assumed by many, and the self-same rapid movements, were also features. The workday was 8 hours in 1 place, and from 9 to 9½ in 7 places, and 10 hours in the remaining 7. In

a few places it was shortened on certain days of the week. Saturday afternoon off was the rule at all places. The noon recess was 1 hour at 1 place, and $\frac{1}{2}$ hour at the remaining 14. The risk of contracting *communicable diseases* was negligible in 5 places, but a fair hazard in the remaining 10, due to such features as common cups and towels, inadequate wash places, poor toilets, absence of lockers, crowding of workers side by side, and lack of medical supervision. In only a few places were men and women working side by side. Medical supervision is quite important since the large machines require a number of persons to work close together. *Poisoning* is no feature of the process, but escaped and incompletely oxidized gas fumes were noticeable in 2 places. The industrial inducement to *stimulantism* was in direct proportion to the extent of heat, moisture and fatigue factors.

The *appearance* of the workers was generally good in 9 places, and no more than fair in the remaining 6. Here and there were some who were plainly affected by the heat. *Comments*.—For the escape of steam there should be provided exhaust hoods as closely suspended over mangles as possible, room exhaust fans, air-agitators and perhaps air-conditioning systems such as a number of places have already installed. In 1 place cool air blasts were provided. Changing about between feeders and folders would do much to vary the monotony of the work, as the folders can usually sit down.

LAUNDRY. — IRONING.

This process was either machine ironing or hand ironing. In the former, goods are passed through cylinders resembling mangles and arranged to suit the classes of goods to be ironed. They are usually operated by the use of a foot lever which is several inches above the floor. The machines operate very fast, as a rule, and have different names, such as body ironers, cuff ironers, etc. In the processes here described, dampening, drying and starching, which are closely associated, are included with ironing.

This was investigated in 21 establishments employing at this process a total of 774 wage-earners, of whom 34 were males and 740 were females. The use of modern methods prevailed in 10 places, fairly so in 6, and not so in the remaining 5. Health appliances, consisting of exhaust fans and air-agitators for room ventilation (and in a few instances of compressed air to operate the rolls, instead of a foot lever), were good in 9 places and absent in the remaining 12. Definite instructions along health lines were being given in 5 places. There were no union organizations. The general type of workers was good in 13 places, fair in 6 more, and largely ignorant foreigners in the remaining. The attitude toward employes appeared excellent in 14 places, fair in 6, and not so in the remaining 1. Retention seemed good in 16 places, fair in 3, and not so in the remaining 2. There were no sick benefit organizations. Work rooms were hygienically constructed in 9 places, fairly so in 3 more, and not so in the remaining 9. Other processes than those mentioned were present in 4 places. There were 14 persons over 40 years of age, and about 80 under 20. The work is unskilled, although a little experience develops a high degree of dexterity.

General *cleanliness* was good in 18 of the places, and at least fair in 2 of the remaining. *Humidity* was a bad hazard in 4 places, fairly so in 6 more, and negligible in the remaining 11, the cause being escaped steam, and, in some

places, wet floors. Seventeen places were well *lighted*, 1 fairly so, and 3 not so. General room *ventilation* was excellent in 5 places, and fair to good in 14 more, but bad in the remaining 2. This was due to motionless air, contamination by unburned gas fumes from heating appliances and somewhat by odors arising from solutions and goods. *Heat* was a bad feature in 2 places, and fairly so in 10 more. *Fatigue* was a factor in practically all places, due to the nature of the work which seems to require (?) constant standing for the majority of the workers, and in a rather unnatural posture, with monotonous movements rapidly performed. The constant use of the foot lever is the most fatiguing feature. In 9 places there was evidence of hurrying piecework. There was also considerable eye strain, due to the constant looking downward upon white and other glazed starched goods. This is more pronounced among hand ironers. The workday was 8 hours in 1 place, 8½ to 9 hours in 4 places, and 9 to 10 hours in the remaining 16, with some variations on certain days. The noon recess was 1 hour in 2 places, and ½ hour in the remaining 19. Overtime was rarely resorted to. The liability to the contraction of *communicable diseases* was negligible in 9 places, a fair hazard in 9 more, and bad in 3, due principally to inadequate wash facilities and closets, the use of common drinking cups and towels, and to the lack of medical supervision, especially for the large number of young females employed. Liability to *poisoning* is no feature of the process itself, provided gas connections are good; otherwise, there is considerable danger of chronic gassing. This is the same for hand ironers, as elsewhere described. The industrial inducement to *stimulantism* was found to be a fair hazard in at least 13 places, due to the depressing influences above described.

The general *appearance* of workers was good in 12 places, and only fair in the remaining 9. *Complaints* by workers themselves were not numerous, although in many instances they appeared either too busy or too timid to answer questions. Their statements consisted chiefly of fatigue symptoms, heat effects, especially in warm weather, and the frequency of headaches and indispositions. *Comments*.—Work variation appears to be the most feasible means of meeting the question of fatigue in this process. This should be insisted upon irrespective of the wishes of employes. Standing upon cement or other hard floors should be prevented by the use of mats, low platforms, etc. Instructions should be given in how to stand, and in the avoidance of awkward postures. The leaning upon hand irons with the breast or stomach is apt to be productive of digestive troubles, chief among which ulcer of the stomach and gall bladder troubles are to be feared. Frail girls should not be permitted to manipulate heavy hand irons nor foot treadle machines. This question of frailty and qualifications for such work cannot be judged by the mere appearance of a worker. All of these employes should be under proper medical supervision. The frequency of lower limb complaints, under par conditions, female disturbances, and neurasthenia among laundresses, is well known. Much headache can be prevented by arranging the workers properly in respect to light, and in the use of eye shades; darkened glasses for workers on white goods would prove very restful. Other features are suggested in health hazards above mentioned.

DRY CLEANING.

Dry cleaning involves various chemical and mechanical processes for the cleaning and removing of spots and stains upon clothing and various textiles.

While naphtha (benzine, gasoline), is the chief chemical used, and that which the vast majority of workers are concerned with, a considerable list of other fat, resin, and color solvents are used by a few skilled workers who understand their solvent powers, and are usually well informed as to their poisonous properties. The process in many places is closely associated with dyeing, so that the workers at one process were subjected to the hazards of the other.

Dry cleaning was the chief process concerned in 25 establishments here reported. These were found to employ a total of 142 wage-earners, 73 of

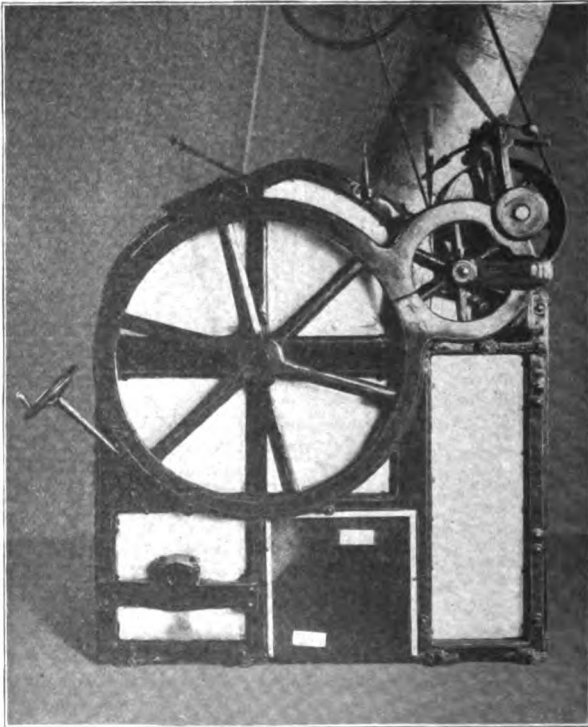


FIG. 51. DRY CLEANING.

A revolving naphtha cleaning tub, completely enclosed and having an excellent exhaust system to remove fumes.

whom were males and 69 females. Thoroughly modern methods and equipments were the rule in 20 places, fairly so in 2 other, and not so in the remaining 3, the largest of which employed 5 persons. Health appliances (see below) to protect the workers from breathing the naphtha fumes were of good efficiency in 7 places, fairly so in 2 others, and not so in the remaining 16. Health placards and definite health instructions were present in 2 places. There were no union organizations, nor were there sick benefit societies. The attitude toward workers, retention of workers, and the type of workers were good

in 21 places, fairly so in 3 more, and not so in the remaining 1. The work itself required no particular skill. Work quarters were hygienically constructed in 14 places, fairly so in 5 others, and not so in the remaining 6. Other processes (other than dyeing) were found occasionally. In all places great care was taken to avoid fires and explosions in the storage and use of naphtha. In dry cleaning itself there were but 3 wage-earners over the age of 40 while very few, if any, appeared to be under the age of 20.

Quarters were kept *clean* in 22 places and fairly so in the other 3. In 7

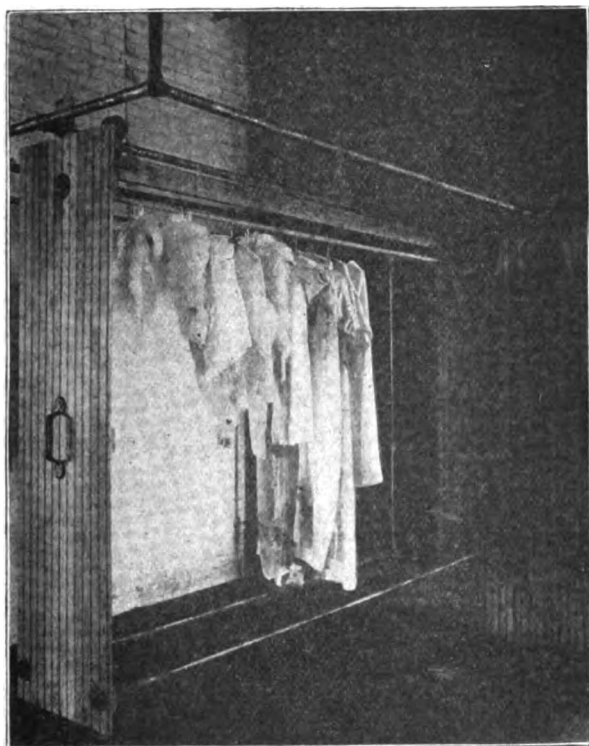


FIG. 52. DRY CLEANING.

Showing method of hot drying of articles so that workers do not need to enter the drying room, which is filled with hot naphtha fumes.

places dampness and *humidity* were fair hazards, while in the balance they were negligible. Quarters were well *lighted* in 20 places, fairly so in 2 others, and not so in the remaining 3. The *air* of the workrooms was satisfactory in 4 places, fairly so in 15 others and not so in the remaining 6, due to the contamination of escaping naphtha fumes. In 2 places quarters were kept *unduly warm*. Workers also had a tendency to dress very lightly, and to expose themselves outdoors, or to *drafts*, rather frequently while so clothed. In some places the isolated dry cleaning building was entirely devoid of heating methods.

Fatigue was a negligible factor in 22 places, but in at least 3 establishments there was constant standing even where females were employed. The work-day was 8 hours in 1 place, from 8½ to 9 hours in 15, and from 9 to 10 in the remaining 9. The noon recess was 1 hour in 13 places, and ½ hour in the remaining 12. Outside of the disputed risk of handling used garments, there was no particular liability toward contracting *communicable diseases* in 21 of the places, while in 4 there was promiscuous spitting about the floors, and the absence of cuspidors. As a rule there were very few employes doing this work in any one place, although in the cleaning of gloves, and similar small pieces, there were as high as 25 females employed. The absence of lockers and the use of common towels and common drinking cups were frequent observations. In 4 places the escape of naphtha fumes was sufficient to cause chronic *poisoning*. Fortunately these were all small places, employing 1 or 2 men at the process. In 19 other places the odor of naphtha was definitely present, but in rather too small amount to affect the health of workers, providing undue individual susceptibility were guarded against. Many workers appeared to expose their hands more than necessary to naphtha. The use of other dangerous substances, such as ether, chloroform, acetone, wood alcohol, benzol, turpentine and carbon bisulphide was always limited in amount, and looked after by a skilled worker. Industrial inducement to *stimulantism* had for its chief factor the depressing influence of the inhalation of the fumes.

The general *appearance* of the workers was good in 19 places, fair in 4 others (including 1 establishment employing 14 help, of whom 8 were females), and poor in the 2 remaining (both small places). In 5 places workers *complained* of poor ventilation and the insufficiency of methods used to remove the fumes. Their symptoms were the usual ones of acute and repeated benzene poisoning. Investigators saw 2 cases of mild, acute benzene poisoning, and 2 whose symptoms were evidently due to chronic benzene poisoning. In several instances workers were remarkably pale as well. *Comments*.—The complete enclosure of naphtha tubs, or the complete confinement of the fumes within the tub, except during brief intervals of opening and closing, were the methods usually taken. In addition, for table work and open vats, room-exhaust fans and hoods locally applied, with down-draft fans, should be used. Floors should be impervious and easily drained.

The subsequent DRYING of the cleaned articles should be done in cabinets or cupboards which do not have to be entered. This can be effected quite easily by the use of sliding racks, upon which the articles are hung, and so arranged that when the rack is within the cupboard, or is in the room outside, the cupboard is entirely closed. There should be, also, a slight suction in this cupboard to prevent leakage into the outside room. It was further claimed that agitating the air in this cupboard greatly facilitated the drying.

CARPET CLEANING.—Carpet cleaning is sometimes also done by dry cleaning establishments. This was investigated in 3 places employing a total of 24 wage-earners, all males. In all places *dust* from the carpets was a bad hazard. In 1 place the people in the neighborhood complained very much on this account. In all places there seemed to be great liability to the contraction of *communicable diseases*, due not only to the dust coming from the carpets but to carelessness in spitting upon the floors and in the inadequacy of wash-places and proper toilets. *Cleaning* of quarters was usually done by dry methods. Windows were depended upon for *ventilation*. Quarters were very

dirty in 1 place. After removing the dust from the carpets, they were next scrubbed either by hand or in a tumbling machine, without any material hazard to health. Again, some rugs, and, even, carpets were cleaned in naphtha baths, without practically any protection from the *fumes*. Fortunately, this latter process was not a continuous one.

DYEING.

The process of dyeing clothes was investigated in 13 places, and of hats in 1 place. The dyeing of textiles (not an extensive industry in Ohio) was investigated in several places as well. The total workers so engaged numbered 422, all males. The type of workers and their retention was good in all but 1 place. The attitude toward workers was good in 10 places, fair in 3, and not so in the remaining 1. There were no unions; also no sick benefit associations. The amount of skill necessary, so far as the workers were concerned, appeared to be very limited, this probably being due, in a large extent, to the use of anilin dyes in modern methods. In 5 places, health appliances consisting of hoods over certain vats and tubs, and room-exhaust fans were good; in the balance they were absent. The construction of the work room was good in 6 places, fair in 3, and poor in the remaining 5. Usually the dyeing room was by itself, but in 2 places washing, steaming and pressing were being done—in 1 place engaging 10 females. There were 6 persons over 40 years of age, and none, apparently, under 20.

Dust is not a feature of the process, although the careless handling of some of the dye ingredients might easily cause poisoning in such form. Quarters were *cleanly* in 10 places, fairly so in 2, and not so in the remaining 2. There was unnecessary exposure to *dampness*, steam and wet floors in 1 place, and a fair exposure in 11 more. Quarters were poorly *lighted* in 4 places, but good in the remaining 10. General room *ventilation* was good in 3 places, fair in 8, and bad in the remaining 3, the hazard of quiet, still air being accentuated in several places by the presence of gasoline fumes and steam. While *heat* is a necessary feature of dyeing, it constituted no health-hazard in 13 places, the remaining 1 being unduly hot. On the other hand, 2 places were very poorly heated for winter work (both small). The process was not *fatiguing*, although there was considerable standing-still. The workday was found to be from 9 to 10 hours in all places; the noon recess 1 hour in 8 places, and $\frac{1}{2}$ hour in 6 places. The liability to the contraction of *communicable diseases* was negligible in 1 place, a fair hazard in 8 others, and considerable in 5 others, due, principally, to promiscuous spitting, absence of cuspidors, inadequate wash places, poor toilets and the use of common cups and towels. (The question of handling used garments is discussed under Dry Cleaning and in Laundry Processes.) The liability to *poisoning* was some hazard in all places, and particularly so in 4, the risk being largely one of personal carelessness. Fortunately, the large majority of anilin dyes are non-poisonous. However, the manufacturers' agents for such dyes claim that it is almost impossible to rid most of them from traces of arsenic. The non-labeling of poisonous dye materials is a serious factor, for it was found that practically none of the workers had any information as to which were poisonous and which were non-poisonous. In addition to the dyes, various cleaning substances, especially naphtha, used in auxiliary processes, were encountered in several places. The

industrial inducement to *stimulantism* was chiefly influenced by the unhealthy character of the air breathed.

The general *appearance* of the workers was good in 12 places and fair in the remaining 2. The chief *complaints* were the effects of steam and escaped gas fumes, while 1 employe mentioned, particularly, dermatitis. *Comments.*—Good workroom ventilation, and the use of hoods over steam and hot processes are the essential features. Beyond this, workmen should be protected by the requiring of a label upon all poisonous dye ingredients. The almost exclusive use of anilin and vegetable dyes in weak solutions seems to have done away with the danger of poisoning after the solutions are made up.

As STEAM CLEANING is more apt to be done in connection with the dyeing quarters than elsewhere, it is mentioned here. Heat, humidity, alternate exposure to drafts, absence of lockers and dry places for street clothes, and of proper wash-up facilities, were the main hazards, and the mention of them suggests the remedies.

(This completes the discussion of Laundrying, Dry Cleaning and Dyeing. Next month the subjects of Storage Batteries, Dry Batteries and Incandescent Lamp Manufacturing will be taken up.)

REPORT ON INVESTIGATION OF DEATH SAID TO BE DUE TO POLLEN POISONING.

E. R. HAYHURST, A. M., M. D.,

Director, Division of Industrial Hygiene, Ohio State Board of Health.

S. L. C., deceased, was a farm overseer employed by the trustees of Ohio Wesleyan University. It was contended that his death was due to poisoning by the pollen from the Ohio Buckeye tree, received into his system in the course of his work. A claim for a death benefit was consequently filed with the Industrial Commission.

The Commission requested that Dr. E. R. Hayhurst, Director of the Division of Industrial Hygiene of the Ohio State Board of Health, make an investigation of the probable cause of death. His report is as follows:

INVESTIGATION INTO THE POSSIBILITY OF POISONING BY THE POLLEN FROM THE OHIO BUCKEYE TREE

(*AESCULUS GLABRA WILLD.*)

Not being familiar with the possibilities of poisoning by this alleged form of poisoning, I addressed communications to various state and government experts, asking for any information which they might give me, as well as their opinions, concerning the poisonous properties of pollens, and particularly of poisonous properties of the Ohio buckeye (*Aesculus glabra Willd.*). Copies of the replies received are submitted herewith. Because of the summer season it was difficult to get into communication with some of the parties and to obtain certain features of information which might have been obtainable at another time.

In addition, a search was made through various authoritative text-books and publications as follows:

Schaffner, Prof. John H., Dept. of Botany, Ohio State University—
"Poisons and Other Injurious Plants of Ohio." Ohio Naturalist
Vol. 4, p. 69, 1903.

Pammel, Prof. L. H., Dept. of Botany, Iowa State College—"A Manual
of Poisonous Plants," 1911, illus. 977 p. The Torch Press, Cedar
Rapids, Iowa.

Small's "Flora of the United States". 1903.

Milspaugh, C. F., "American Medical Plants". Quoted by Pammel.

Blyth, A. W. and 'M. W., "Poisons; Their Effects and Detection". 4th
ed., 1906, 772 p. Charles Griffin & Co., Ltd. London.

Autenreith, Dr. Wilhelm, Prof. in the Univ. of Freiburg (authorized
translation of the 4th German edition by Wm. H. Warren, Ph.D.,
Prof. of Chem. in Wheaton College). 1915. 320 p. P. Blakiston's
& Son Co., Phil.

Identification of the Ohio Buckeye:

Small, p. 740—"Aesculus glabra Willd. Ohio buckeye. Stinking buckeye".

Pammel, pp. 616-617—"Hippocastanaceae. Buckeye Family. *Aesculus* L.
Buckeye. Trees or shrubs * * * A small genus of 15 species
native of America and Asia. The horse chestnut (*Aesculus Hippo-*
castanum), escaped from cultivation is planted for ornamental pur-
poses, as are others of the genus, like the species described below
and *A. parviflora*, a small shrub." "*Aesculus glabra* Willd. Ohio
Buckeye. * * * ". (A botanical description of the plant is given).

Distribution of the Ohio Buckeye:

Small, — P. 740—"Pennsylvania to Kansas, Indian Territory to Alabama."

Pammel, p. 617—"Western Pennsylvania to Central Iowa, Kansas and
Indian Territory".

Uses:

Pammel, p. 617—"For ornamental purposes. * * * By washing and
boiling, the starch in the seed may be utilized, and this is done in
France with the horse chestnut. The wood is light and brittle. The
wood of the Ohio buckeye is used for making violins."

Poisonous Properties and Other Characteristics:

Schaffner, John H. (See reference above):—"Aesculus glabra Willd.
Leaves and young shoots and seeds poisonous to cattle".

Pammel, p. 123—"Important Poisonous Plants. *Aesculus glabra* Willd.
Ohio Buckeye".

Pammel, p. 827—"Poisonous Plants of the World:

Family: Hippocastanaceae.

Genus: Aesculus.

Species: Glabra.

Authority: Smith, S. B., 1905. Bristol. 'Poisonous Plants of All
Countries'.

Chestnut, V. K., 'Preliminary Catalogue of Plants Poisonous to
Stock,' Annual Report, Bureau Animal Industry, U. S. De-
partment of Agriculture. 15: 387-420.

(Poisonous) Properties: Saponin.

Locality: North America."

Pammel, pages 62-63: "Poisoning from Plants that Contain Saponin.

"In recent years our knowledge of the Saponins has been greatly extended; many of these studies have been made by Kobert or his students in the laboratory at Dorpat. The term saponin has been applied to a class of substances of a glucosidal nature which are poisonous, and, when dissolved in water, form a solution which froths much like soapsuds. These substances are not all the same chemically, but have the general formula $C_nH_{2n}O_{12}$. Blythe gives the following list of their formulae: (List omitted).

"One of the oldest of the known saponins was isolated from the Bouncing Betty, *Saponaria officinalis*, and later from the corn cockle *Agrostemma Githago* and many other plants. This saponin is a white amorphous powder, very soluble in water, is neutral and reacts without odor; it causes sneezing when applied to the mucous membrane of the nose; tastes at first sweetish, then becomes sharp and acrid. The saponin when rubbed on the skin exerts no action because not absorbed; when injected subcutaneously into frogs it becomes quickly absorbed and acts upon the nerves and muscles. In warm blooded animals there is little or no absorption because of an aseptic abscess which forms. Intravenous injections in small amounts in the laboratory of Kobert proved fatal for cats and dogs. It acts injuriously on the striated muscle and heart muscle. The sensor and motor nerve fibers are also affected in a serious way. On the digestive tract it causes inflammation and peristalsis. The saponin substances dissolve the blood corpuscles of all animals and thus penetrate the corpuscles. It is thought that the haemolytic action of these substances is due to the liquefaction of the cell membrane." * * *

"Dr. R. F. Bacon and H. T. Marshall who made a study of the saponin found in *Entada scandens* proved that it was highly toxic for rabbits and guinea pigs." * * *

"Blyth has studied the general action of saponin on kittens. He states that when 13 to 22 mm. ($1/5$ to $1/2$ gr.) is injected underneath the skin of a kitten immediately symptoms of local pain occur, in 5 to 10 minutes the respiration is quicker and the animal falls into a lethargic condition with signs of muscular weakness; just before death breathing became rapid with all the signs of asphyxia. The appearances after that were fullness in the right side of the heart and congestion of the intestinal canal. In man the taking of saponin, causes an increase of mucus secretion and nausea.

"Saponin or saponin-like substances occur in the following families: (A long list is given in which *Aescula Hippocastanum* is mentioned.)

"In all more than 200 species of plants contain saponin."

Pammel, p. 617-618: "*Poisonous Properties*. The leaves and fruit of the above species are regarded as poisonous. Many farmers claim that this is true only at certain seasons of the year. The seed produces sneezing and enters into the manufacture of snuff. The California species, according to Chestnut, causes abortion in cows. Dr. Rusby states that in the Southern states the seeds are crushed and thrown into water to stupify fish just as the bark and roots of the relatives are in the tropics. Fatal cases of poisoning of children are reported from Texas. Suspicion has been attached to the common horse chestnut. (Then follows comment upon the European chestnut and the chemical properties of the same, which species also contains saponin) Dr. Millsbaugh states that the horse chestnut causes inflammation of the mucous membranes of the respiratory and digestive tracts, and especially of the rectum; constant burning of the stomach and epigastrium, followed by nausea, retching, and violent vomiting with great tenderness and colic throughout the abdomen, are markedly present. (These features apply to the eating and swallowing of the nut.) The buckeye is an irritant of the cerebro-spinal system, the more prominent symptoms being confusion of mind, vertigo, stupefaction and coma."

Millsbaugh: (quoted by Pammel, p. 586): *Senecgin*, found in snake root, is regarded as identical with *saponin*. According to the author quoted above, in doses of 10 minims of the tincture to a scruple of the powdered root, it produces: "Anxiousness, with dullness of the head and vertigo; aching and weakness of the eyes, with lachrymation, pressure in the ball, flickerings, dazzling vision, and contracted pupils; sneezing; ptialism (increased flow of saliva with spitting); inflammation of the fauces (throat) and eosophagus,

with thirst with anorexia (loss of appetite); nausea; mucous vomiting; burning in the stomach; cutting colic (presupposing that the substance has been swallowed); roughness and irritation of the larynx, with orgasm of blood to the chest, accompanied by constriction, aching, soreness, and oppression; general debility; restless sleep; and profuse diaphoresis (sweating)."

"Blyth, pp. 450-452: *"Saponin—Saponin Substances.*

The term "saponin" of late years has been applied to a class of glucosides which possess the common property of being poisonous, and, when dissolved in water, forming solutions which froth on shaking like soap suds.

"The substances which have these properties are not all of the same series chemically, but those of the general formula, $C_nH_{2n}O_{10}$." (Next follows a list of the substances.)

"There are some 150 distinct plants which thus yield saponins; a few of these are as follows:" (Then follows another list.)

"Properties.—Saponin is a white amorphous powder, very soluble in water, to which it gives a curious property of frothing just like soap suds. To obtain this effect there must be at least 1 mgrm. in 1 c. c. of liquid. Saponin is neutral in reaction, it has no odor, but causes sneezing if applied to the mucous membrane of the nose; the taste is at first sweet, and then sharp and acrid. It is almost entirely insoluble in absolute alcohol but dissolves in hot alcohol of 83 degrees to separate again nearly completely on cooling." (Then follows a description of chemical characteristics.)

"Effects.— * * * The senior author has studied the general action of saponin on kittens, insects, and infusoria. Small doses, as from 13 to 32 mgrms. (1/5 to 1/2 grain), were injected beneath the loose skin of the back of the neck of a kitten, when there were immediate symptoms of local pains. In from 5 to 10 minutes the respiration notably quickened, and the animal fell into a lethargic state, with signs of general muscular weakness; just before death the breathing became very rapid, and there were all the signs of asphyxia. The pathological appearances after death were fullness in the right side of the heart, and intense congestion of intestinal canal, the stomach generally being perfectly normal in appearance, and the kidneys and other organs healthy. The least fatal dose for a kitten seems to be 13 mgrms., or .04 grm. to a kilogramme.

"Action on Man.—The effects of saponin on man have been but little studied; it has been administered by the mouth in doses of from .1 to .2 grm., and in those doses seems to have distinct physiological effects. There is increased mucous secretion, and a feeling of nausea; but neither diaphoresis nor diuresis (urination) has been observed. From the foregoing study it may be predicated that 2.6 grms. (40 grains), if administered subcutaneously to an adult, would endanger life. The symptoms would be great muscular prostration, weakness of the heart's action, and probably diarrhoea. In fatal cases, some signs of an irritant or inflammatory action on the mucous membranes of the stomach and intestines would be probable."

Autenreith-Warren, pps. 213-214: *"Saponins.*—The term saponins, or saponin substances, include a large number of glucoside-like bodies of widespread occurrence in the vegetable kingdom and having in common certain chemical, physical and especially physiological properties. Their aqueous solutions when shaken, foam readily. In this respect they resemble the soaps. Many saponin substances have a sharp, harsh taste. In powdered form they excite violent sneezing." (Then follows a long technical description of chemical properties.)

"Physiological action of Saponins.—Almost without exception saponin substances are highly toxic, if introduced directly into the blood. Most saponins are absorbed with difficulty. Consequently healthy individuals may take dilute saponin solutions by the mouth in considerable quantities without ill effects. Toxic saponins act in common as protoplasmic irritants. In large doses saponin substances kill protoplasm (tissue substance). They manifest in various ways their power of acting as protoplasmic poisons. Saponins act upon blood-corpuscles for the same reason." (There follows a long technical description of the action upon blood-corpuscles and chemical bodies found in the blood.) "Saponin solutions also dissolve white corpuscles but

only at higher concentrations. A physiological action characteristic of many saponins is attributed in the stupefaction and killing of fish, even in water containing only 1:200,000 of saponin substance (R. Kobert)."

PERSONAL INVESTIGATION OF CERTAIN AUTOPSICAL MATERIALS IN THE LABORATORY OF DOCTORS COONS, BARNES, AND BRUNDAGE, COLUMBUS, OHIO.

Upon request of Dr. A. W. Binckley, Chief Medical Examiner, and Mr. K. T. Zimmerman, Investigator of Claims of the Ohio Industrial Commission, I visited the laboratory of Doctors Coons, Barnes and Brundage upon the afternoon of Tuesday, August 3, 1915, and upon my own desire, again upon the afternoon of Thursday, August 12, in company with Dr. F. G. Boudreau of the Ohio State Board of Health, in order to examine certain autopsical materials which had been removed at the time of the post-mortem held upon the body of the said S. L. C., and prepared for preservation and examination.

Value of the Post-Mortem Specimens.—It is well recognized that the sooner a necropsy can be made upon a body, dead with any form of infection present, the better are the possibilities for accurately diagnosing the pathological changes present. This is because the infectious agents present continue to at after death with a resultant rapid disintegration and dissolution of tissues and parts through putrefactive changes. A few hours may be all that is necessary to render such necropsical material quite valueless for drawing conclusions. In the case in question, it is to be noted that the autopsy was held on the 10th day after death, the body having to be dug up and removed from the grave for the purpose. On the other hand, it is to be noted that in this case certain embalming manipulations, including the injection of fluids of a preservative character had been performed. While such manipulations, if performed within an hour or two after death, would greatly enhance the possibility of securing materials from the body which would be of value from a diagnostic standpoint, several important features are also to be considered: (1) The length of time which *did* intervene between death and the embalming process (2) the character of the embalming fluids used. We will assume, however, that these were of efficient type and strength to stop all germ life upon contact; (3) the completeness with which the embalming fluids reached and saturated the various organs and parts of the body; and (4) the destructive changes which the embalming fluid itself, injected, as it usually is, under several feet of pressure, might bring about in the blood-vessel system throughout the body, especially in the matter of forcing of the blood out of certain vessels and damming the same up in other vessels and parts, with the rupture of blood-vessel walls and consequent passage of blood-cells out into the tissue.

GROSS FINDINGS.

The only *gross* specimen observed and studied by me was the heart, which had features as described below.

Size of the Heart.—The organ was somewhat enlarged, a considerable part of which, however, was due to layers of apparently healthy fatty tissue deposited about the base and in the various sulci and other depressions of that organ and in a normal manner for such depositions. It was impossible to estimate to what extent post-mortem changes, and which changes may have occurred just preceding death, may have had to do with this enlargement, or swelling, of the tissues of which the organ is composed. Also, I could not satisfy myself that the heart was enlarged beyond the physiological requirements of a man of the deceased's weight, build and occupation.

Color of the Heart.—In this connection, also, indefinite conclusions only can be drawn from the organ, so long after death and subject to preserving fluids. However, there was no evidence in the heart walls of a so-called "soldier spot" or area of white, yellow or gray nature, which indicates to the naked eye chronic myocarditis, or long-standing disease changes, due to poor

nourishment and a replacement of muscular tissue by fibrous tissue, the same being a result of poor or impeded circulation to the part. Abnormal areas of reddish, dark, or high-colored character upon the surface of the heart or within the walls and tissues of the same, due to long-standing disease accompanied by pigmentation, would be impossible to distinguish from *recent* anti-mortem or *subsequent* post-mortem changes and hence such discoloration would be of very little value diagnostically. Such areas were apparent toward the apex of the left ventricle and throughout the greater part of the wall of the right ventricle,—a common post-mortem condition quite irrespective of the cause of death.

Other physical features (with the exception of the coronary arteries—See below), such as *shape, surface, markings, resistancy* upon cutting, *thickness* of walls and parts, *consistency, serous membrane coverings and linings*, and *clot inclusions*, I consider as offering no evidence of any value because of the length of time and the manipulations which the organ had under gone between death and the time of the examination.

Coronary Arteries.—Grossly, there was to be observed in the anterior descending branch of the left coronary artery a marked hardness or stony-like character of the vessel wall extending from about the origin of this branch itself to a point an inch or more downwards. There was no evidence that this condition affected other branches of this artery or of the right coronary artery, although it is probable that other branches were more or less thickened. This disease change had not affected the opening of the coronary artery into the aorta, nor was there any evidence of disease of the valves of the heart or of the great vessels themselves as they entered, or left, the heart. While this condition had undoubtedly been of more than two weeks' standing and probably of several years, and had resulted in a narrowing of the lumen of the blood vessel with some consequent interference, probably, with the blood supply of that part of the heart to which this branch was distributed, there was (as stated above) no gross evidence that the nutrition of the area so supplied had as yet been interfered with.

MICROSCOPICAL FINDINGS.

Dr. Coons showed me specimens of such organs and parts as he had found of interest and which might have a bearing upon the diagnosis. I examined microscopically tissues of the organs below named, prepared and mounted according to the usual methods:

The Heart.—About 10 or 12 specimens were examined which had been taken from various parts of the area supplied by the diseased artery, above named, and representing levels from the upper part of the anterior surface of the left ventricle to within probably an inch and a half of the apex of the heart and including some papillary-muscle and some septal-muscle tissue. Unfortunately, Dr. Coons was not able to find a section or two which he had prepared of the apex of the left ventricle itself which, he said, showed most evidence of pathological change, and some of which he considered to be long-standing or of chronic myocarditic type.—In all of the specimens which I examined, I could see very little evidence of chronic or long-standing changes. I base this statement particularly upon the practical absence of the following features which are recognized as characteristic of chronic disease in the walls of the heart: (1) fibrous patches between muscle bundles often of stellate appearance; (2) atrophic or shrunken muscle fibers; (3) enlarged and blunt-ended nuclei of the muscle fibers; (4) decrease in number of nuclei of muscle fibers; (5) decrease in number of nuclear elements as is common in scar-tissue or fibrous tissue; (6) new formed capillaries; (7) obliteration of other capillaries by fibrous changes; (8) areas of inflammatory infiltration of long-standing character; (9) marked hypertrophy, or overgrowth, or healthy muscle fibers; (10) evidences of fatty degeneration; (11) chronic degenerative changes in the muscle fibers; and, (12) evidences of pigmentation of long-standing character, at least such as could be considered abnormal for a person at this period of life. Such pigmentation present was very little noticeable.—Evidences of *acute* myocarditis were, of course, to be expected as an accompaniment of the infection present at the time of death (hyalin

degeneration, loss of striations, poorly stained nuclei in clouded areas, extravasated blood-pigment and blood-cells), but even these changes were not extensive.—*Summary:* With the exception of the changes in the coronary artery above described. I saw nothing of disease character which might not have occurred, in my opinion, within the week or two previous to death.—On my second visit with Dr. Boudreau 9 days later, we re-examined the various sections and Dr. Boudreau concurs with me in the above findings. I regret that the new specimens which Dr. Coons was having made from the apex of the heart itself were not ready upon the date of my last visit, but I am of the opinion that even if of a quite pronounced type, the extent of the changes present would not have been sufficient and their location important enough to warrant the conclusion that the same were the immediate cause of death, nor more than contributory to the cause of death.

Lungs.—Sections of the lung tissues showed all the evidences of a marked broncho-pneumonia as described in the autopsical records submitted by Dr. Coons.

Kidneys.—The kidneys, liver, pancreas, spleen, and one or two other parts showed microscopically no evidences of chronic disease. All, however, including sections from the heart as well, showed scattered areas of small round-cell infiltration of limited extent which undoubtedly took place the last few days preceding death, and represented the reaction in a wide scattering of inflammatory material, probably simultaneous with the appearance of the spots which the evidence affirms appeared upon the skin a few days before death. In other words, signs characteristic, I believe, of a pyemic process occurring in the course of an infection, in which attempts at repair had taken place (small round-cell infiltration).

Vascular Changes.—I would point out that all vascular changes such as congestion of blood vessels, extravasation of blood-cells and blood material and, in other parts, absence of blood material where its presence would be expected, must be considered as without significance principally because of the manipulations in embalming.

GENERAL CONCLUSIONS.

(1) The clinical evidence, as submitted by the several physicians and in the depositions of Mr. H. H. Hamm, Director of Claims, Industrial Commission of Ohio, under dates of June 28th and July 2nd, 1915, is to the effect that the victim died of an infection secondary to some form of poison which had its portal of entry in the eye, or eyes, the nose, the throat and probably the windpipe.

(2) The contention that this poison was derived from the pollen of the "Ohio Buckeye" tree as stated upon the death certificate, is only inferential and circumstantial. An inquiry among state and government experts in the field of botany and toxicology produces no conclusive evidence that the pollen itself from this particular plant is, or is not, poisonous. In brief, there is no information of positive character so far as is known upon this point. It is, however, known that certain parts of the "Ohio Buckeye" tree, for instance, the nut or fruit, the young shoots and leaves, contain a poisonous substance called *saponin*. Saponin is a definite poison belonging to the group of organic chemical bodies known as glucosides. The symptoms which accompany saponin poisoning are of the same character as those from which it is claimed, the victim suffered during the first few days of this illness, and consist essentially of an inflammation of the mucous membranes with which the poison has come in contact. It is to be noted that this poison is present in a number of other plants which are known to be common to Ohio and with which the victim has come into contact. It is also to be emphasized that individuals vary greatly in their respective susceptibilities to various poisons. Furthermore, the clinical evidence tends to show that a secondary infection became ingrafted upon the condition of poisoning.

(3) The findings of the post-mortem which, unfortunately, was not made until the 10th day after death and after the body had been subjected to embalming manipulations and embalming fluids, and had been buried for several days, may only be tentatively accepted. Insofar as positive ante-

mortem changes are concerned, these point to an acute (short time) infection as the immediate cause of death. This infection consisted of bronchopneumonia, bronchitis, tracheitis (infection of the windpipe), and inflammatory deposits of recent origin in the various vital organs. There was in addition evidence of some abnormal condition of the lining of the larynx (voice box), which, however, may have been due to post-mortem changes. The interior of the nose and naso pharynx, and pharynx, are not reported upon. It is probable that these surfaces had undergone post-mortem changes too great to warrant examining them.

(4) The general autopsical statement appears to show that the victim was in a normal condition of health as respected his general musculature and tissues, and without evidence of chronic (long-standing) disease of any nature in any of the vital organs, so far as the post-mortem examination could determine, with the exception of one of the coronary arteries of the heart. One branch of this, in particular, shows evidence of chronic disease in the structure of its coats, which could not be accepted as physiological for a man of the victim's age. Such disease was unassociated with similar evidence in any other artery, or vessel, in the body. There was, on the other hand, a lack of sufficient evidence of damage to heart-muscle and heart-tissue as the result of this diseased arterial branch to affirm that such could have been the immediate cause of death, or that the victim could not have lived some time longer so far as this condition was concerned.

(5) The *clinical* evidence concerning the previous *health* of the victim, appears, also, to be free from indications of any form of cardiac disease, or of other chronic disease. (Chronic myocarditis of serious import is usually accompanied by symptoms, such as pains about the heart, and irregular pulse, shortness of breath on ordinary exertion, and a tendency to dropsical conditions. It is also accompanied usually by signs and symptoms of chronic disease in other organs and parts, particularly the kidneys, great blood vessel, liver and spleen).

(6) The question as to whether death resulting from pollen poisoning or similar poisoning from a plant source and acquired during the pursuit of one's industrial duties, is an occupational *accident*, or an occupational *disease*, I would unhesitatingly decide to belong to the accident class, because:

(a) The victim and the injurious agent were required to meet but once to bring about the condition of damaged tissue which resulted. The same might be said of some infectious processes (diphtheria, gonorrhoea, syphilis: malaria, also) which are called diseases, but there is this distinction to be made: In such processes the injurious agents multiply themselves after gaining access to the tissues and thus produce their damage, but in the case of poisons there is no increase of the poisonous substance and the damaged tissue results from the effects both of the application of the poison and the efforts made on the part of the body to eliminate the same.

(b) The conception of an *occupational disease* is based upon the existence of three phases of recognizable tissue forms (1) *normal* tissue, before the injurious agent is applied, (2) *strained* or tolerating tissue, or tissue in the stage of having its normal functions vigorously exerted while the injurious agent is being applied (during this stage a return to the normal form is always possible and will take place upon the removal of the injurious agent), and (3) *damaged* or diseased tissue. The conception of an *injury due to an act of violence* includes but the first and last of these three stages of tissue, i. e., normal tissue before the injurious agent is applied, and, damaged tissue after it is applied. From this it can be seen that there is no opportunity to return to the normal condition after the agent is once applied (as is possible in the case of an agent which causes a disease). As more commonly conceived, a disease-producing agent must be constant in its action, or constantly reapplied, in order to bring about its effects.

(c) The fact that the exact time of the application of an injurious agent and even the exact place upon the body of its application, or its portal of entry into the body, may not be ascertainable, does not preclude the possibility of its presence and its effects because the agent may in its application, be beyond the limits of ordinary sensibility (i. e., it may be in the well

recognized physiological field called "sub-threshold" sensibility) and still be existant and capable of inflicting a wound of serious consequences.

(7) In conclusion, my opinion is that the victim met with an accident in the nature of a poisoning of saponin character and plant origin, which was followed by a secondary infection of fatal consequences, and that while certain parts of this evidence are, and necessarily must be, circumstantial in character, there is no good evidence, so far as submitted to me or which I have been able to discover, to the effect that he died from any other cause, or in any other manner.

INVESTIGATION OF THE EMPLOYMENT OF MINORS UPON TRUCK FARMS, PARTICULARLY ONION AND CELERY FARMS IN SOME LOCALITIES IN OHIO.

E. R. HAYHURST, A. M., M. D.,

Director of the Division of Industrial Hygiene Ohio State Board of Health.

The question of the employment of minors in hitherto unprohibited occupations, namely, upon truck farms and special gardens, having come to the attention of the Industrial Commission, the Attorney General gave to the Commission his opinion that the question raised should be submitted to the State Board of Health for consideration under the provisions of Section 13003 of the General Code, which provides that the State Board of Health may determine whether or not any particular trade or occupation in which the employment of minors under the age of sixteen years is not already forbidden, is sufficiently dangerous to the lives or limbs, or injurious to the health or morals, of children under sixteen years of age to justify their exclusion therefrom.

Accordingly, at the request of Dr. E. F. McCampbell, Secretary and Executive Officer of the Ohio State Board of Health, an investigation was conducted by Dr. E. R. Hayhurst, Director of the Division of Industrial Hygiene, of the State Board of Health, in various localities of the state.

INVESTIGATION AT LODI, OHIO.

Local Physicians' Reports:—I visited Dr. E. L. C., who has been located at Lodi for about ten years. In brief, his evidence was to the effect that there had been heat prostrations among the workers in the fields, the last incidences occurring a year or so ago. Adults are more liable to heat prostration than minors. With proper medical supervision he regarded the work as healthful for the minors employed. There was no evidence of undue prevalence of tetanus, or lockjaw. On hot days, with a certain state of dryness of the ground, there were some minor complaints of soreness of the knees of the child workers, but never anything serious. He does not believe that the typhoid fever rate among them is excessive. There is no evidence of malaria.

Dr. J. E. W., who has practiced at Lodi for about twenty-five years, considered the work upon these farms as not detrimental to the health of normal youths and his testimony practically substantiated that of Dr. C.

Investigations in the Fields.—I was taken to the field of the H.-W. Company at 10:30 a. m. by Dr. C. and communicated with various representa-

tives of that company, which controls some 1200 acres at Lodi and is the only company employing minors, with any regularity, in this vicinity. I spent the entire afternoon in the fields with the superintendent. Mr. M., who drove me about from place to place over most of the company's grounds.

The business is 27 years old in this vicinity and throughout this time it has been the custom to employ minors for weeding, for pulling onions and for topping onions and certain other work of like nature in the raising and care of vegetables. There were employed on this date 298 persons, divided as follows:

Men	159
Women	28
Boys	86
Girls	25
Total	<hr/> 298

On "big days" a total of as many as 400 may be employed. The men work in groups by themselves, except that two boys were noted in connection with one group of men. The women work in groups by themselves. The boys work in groups by themselves, under the supervision of male overseers. The girls work in groups by themselves, under the supervision of female overseers. I took the names, ages, number of seasons employed at this form of work, and the place of residence of all of the boys and girls employed upon this day. The following summary is submitted for 103 boys and girls, the remaining 8 being, it was found, over sixteen years of age:

MALES.

<i>Age in Years.</i>	<i>No.</i>	<i>No. Seasons Worked.</i>										<i>Age at Beginning in Years.</i>									
		1	2	3	4	5	6	7	8	6	7	8	9	10	11	12	13	14	15	16	
8	2	1	2	..	3	..	..	..	8	2	..	7	..	..	..	..	..	..	..	..
9	6	1	1	3	2	..	..	..	..	2	3	..	1	3	..	..	..	..	..	..
10	10	3	1	3	3	..	..	..	..	..	5	5	2	2	1	..	..	..	..	..
11	8	1	..	2	..	5	..	..	..	1	..	..	2	1	1	5	..	..	..	..
12	10	5	..	1	1	2	..	1	..	1	..	5	2	1	1	..	..	..	..	..
13	17	2	2	1	4	3	..	5	..	..	5	..	3	4	1	2	2	..	..	..
14	9	2	1	2	..	..	3	..	1	..	1	..	3	..	..	2	1	2	..	..
15	15	4	2	1	1	..	1	1	5	..	..	5	1	1	..	1	1	2	4	..
*16	6	1	1	1	1	..	1	..	1	..	..	..	..	..	1	..	1	1	1	1
Total ..	83	19	9	14	12	10	5	7	7	5	18	10	12	9	3	10	5	5	5	1	

FEMALES.

<i>Age in Years.</i>	<i>No.</i>	<i>No. Seasons Worked.</i>										<i>Age at Beginning in Years.</i>								
		1	2	3	4	5	6	7	8	6	7	8	9	10	11	12	13	14	15	16
8	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	2	..	2	..	..	..	..	..	..	..	..	2	..	3	..	..	..	..	..	..
10	3	3	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..
11	2	..	..	..	2	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..
12	3	1	..	..	1	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..
13	2	..	..	..	1	1	..	..	..	..	..	1	1	1	1	..	..	..	..	..
14	7	2	1	..	1	2	1	..	..	..	..	1	2	..	..	..	..	2	..	..
15	0	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
*16	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Total ..	20	6	3	..	5	4	1	..	1	..	1	6	4	4	1	2	..	2	..	..

* There may have been more boys and girls of 16 years of age, but they were not working among the younger children.

The season begins about the middle of April with weeding and continues more or less throughout the summer until September, when pulling and topping begins. The height of the weeding season appears to be June and July. The company aims to employ no children during school months who should be attending school. Today one group, numbering 17 minors, has been brought over by one of the foremen by wagon from Lafayette, a distance by road of about 8 miles. Another group is brought over similarly from Burbank, a distance of about 2 miles. This is a daily procedure. Numbers of others walk in from the vicinity for a distance of 2 miles and upwards. Usually those from near-neighborhoods are employed in the part of the field nearest to that vicinity.

The work day is 10 hours, starting at 6:30 a. m. (central time) to 11:30 and from 12:30 to 5:30. A lunch period of about 15 minutes is customary at about 9:30 and 3:30. In addition, a brief rest is allowed at the end of each row, or approximately every hour. The minors work in parallel rows, the younger ones taking one row, the older ones from two to three at a time. They are paid proportionately. An examination of the timekeeper's book for this day shows wages running from \$0.50 to \$1.10. The vast majority receive between 65c and 85c. It is customary, as a matter of discipline, to dock the children from 5c to 25c, according to misdemeanors perpetrated. However, it was stated by the superintendent that very little of this was necessary. Work is not steady, in that the weather may interrupt the same, while, at other times help is required but a few days out of each week.

Shelter shacks are scattered about over the fields and appear sufficient to provide against the inclemency of summer weather. Outhouses consist of plain board privies placed over ditches, and hence without a vault or base. There are no fly screens nor privacy screens. Toilet paper is not furnished. Offal remains in dry ditches, or follows the water current in flooded ditches. The ditches are used for irrigation purposes as well as for drainage, according to requirements. The privies appear to be sufficient in number. There are no separate privies for the two sexes.

The water supply consists of drilled wells at frequent intervals throughout the field, the water being brought to the surface through a continuous pipe. These wells are located along the ditches and without regard to the location of privies. The water is said to have been examined on one or two occasions and to have been found pure and safe for drinking purposes. In one instance a well was found to be located within about 30 feet of a privy over a ditch flooded with water, which ditch passed within two or three feet of the well. Likelihood of contamination of the drinking water supply would appear to depend largely upon the impervious character of the piping up to the pump. The pumps sometimes require priming and there is danger that persons may use the ditch water for the same.

The ground on this day was very damp. At other times it is said to be very dry and dusty, (particularly was it so earlier in this season).

First Aid provisions are very meagre, although accidents are doubtless very few. At the shipping center, Garden Isle, Mr. M., who is an ex-veterinary surgeon, keeps on hand some disinfectants and dressings. He provides olive oil and carbolic acid for sore knees. He maintains that personal uncleanness is largely responsible for this condition. Outside of the wells, there are no provisions for bathing, but children are encouraged to go swimming in a creek which neighbors one part of the field. A considerable number of children belong to families who live on the grounds in yellow-painted, one and one-half story, frame buildings provided by the company. These buildings are sufficient protection for the summer season, but unfortunately are very insufficiently provided with windows and, therefore, ventilation arrangements. This condition would appear very easy to remedy. Some families are also very large and crowding exists. A large number of workmen also live on the premises at various points and are usually bunked by themselves. Their quarters are sufficient protection from the weather for the seasons in which they work, but are also very poorly lighted and ventilated, while crowding exists.

In matters of dress, the employees furnish their own clothes, usually overalls, jumpers and broad brimmed hats. The youths of both sexes go

barefooted to a considerable extent. The girls all wear jumpers, or overalls, within which it is said they tuck their skirts. A number of them also wear short-sleeved dresses and protect the arms with old stockings. The girls are more apt to wear shoes than the boys.

As far as could be ascertained, the general attitude of the employers toward minors was good, as well as the interest in the welfare of employees. It was impossible, of course, by this form of investigation, to ascertain what relationships might exist between the individual overseers and the groups who worked under them. All workers were supposed to keep up to the groups with which they were working. It was said that young children were not sought, because they could not concentrate on the work, played too much and sometimes would not distinguish well between weeds and vegetables. While the employers compelled no children to work, they were not responsible for parental coercion and exactions. They offer employment, are in need of the services, and pay in proportion to what they consider the different workers' merit. There is no physical supervision, sickly or weakly children are just as liable to be employed as the healthy. One argument for this, is, that instances are known where such children have improved in health.

As the groups were inspected, a total of 14 out of 110 employed appeared physically weak, or anemic, or stunted in growth. It cannot be said, however, that this in an undue proportion of such children in any group of this number selected in any vicinity. On the other hand, it cannot be said that these particular children were being benefited by the work. The day of inspection being a cool and invigorating one, there were no plain evidences of fatigue.

There is another feature which should be considered, that of the presence of the contagious eye disease, *trachoma*, or granulated eyelids. Among the last 58 children inspected, I found 6 afflicted with conjunctivitis, one or two of whom I felt convinced were suffering from trachoma. It is to be noted in this connection that one group of foreigners, consisting of about 15 to 20 boys, and a considerable number of men, in some instances, I believe, with their families, have come from Youngstown, Ohio, where there has been great prevalence of this disease among this class of workers. It would require an eye specialist to identify the character of the eye inflammations which I observed. Some of them I have no doubt, were of temporary character, due to the getting of dirt and dust into the eye. The situation, however, shows the urgent need of medical supervision in the employing of minors, if for no other reason than to prevent the spread of communicable diseases.

INVESTIGATION AT KENT, RAVENNA AND THE SURROUNDING COUNTRY.

General Comments.—The principal muck farms in this district were visited by automobile. The operations are all on a very much smaller scale than those at Lodi. The farms visited were those of H. G. L., R. E. L., E. E. G., C. R. and W. S. R. & Son at Kent, Ohio, also the H. P. Farm, the V. Farm, the F. Farm and the P. Farm between Kent and Ravenna. Here I found some boys employed, but no girls at any place. The boys did not work steadily as at Lodi, but came out from the neighboring towns, or villages, more or less irregularly to assist. While usually Americans, there were some Italians and Southern Europeans encountered. They work from 8 to 10 hours per day. I saw none under ten years of age and they were paid, as a rule, 10c an hour straight. At some places they worked from 7 to 1 with one hour for lunch. All those seen, about twenty-five in number, appeared healthy. Employers stated that they were a very independent lot; that it did not pay to have children under ten years around and, in some instances, where as many as 10 to 12 help were used, men were much preferred. Some of the farms have employed as high as 30 boys at one time, while one place near Ravenna said that they had had as many as 100 in past years. They are not worked under overseers in this district, probably because of the small numbers employed by each owner. One of the largest owners felt quite convinced that the work was too strenuous for youths under 12 or even 14 years

and that they should not be employed in this class of work because of the exposure to heat on hot days, the dusts and the constantly stooping-over postures.

I was referred also to the conditions which were said to prevail in the Copley Swamps west of Akron, where foreigners with their families had taken up the grounds upon shares and are said to exploit their children and others, who may work for them, in the onion and celery fields. I did not get an opportunity to visit this district.

INVESTIGATION AT KENTON, McGUFFY AND THE SCIOTO SWAMPS.

This whole district is one vast area, covering some 16,000 acres known as the Scioto Swamp, or "muck lands." It begins a few miles west of Kenton and extends along the south side of the Erie Railroad through Foraker, McGuffy and Alger. It is about ten miles in extent in both directions. McGuffy lies at about the center of the northern border of it. Unfortunately, at the time of my visit, practically the whole area was under a foot or two of water, due to the recent floods. The crops had all been destroyed and the workers were idle, or were leaving the vicinities upon every train.

General Comments.—I consulted with Professor H., superintendent of the schools at Kenton, who informed me about as follows:

For some 30 to 40 pupils, the McGuffy onion fields have greatly interrupted school attendance each year in Kenton. This was much more so up to a year or so ago, but still continues a feature. They remain out in the onion fields until late in October, and leave again for the fields from the first of April to May in the spring. This group of pupils is always behind in studies. Most of them are children of Kentucky families who began to come to the marsh districts some four or five years ago. While most of these families return to Kentucky each autumn, some of them move into Kenton over the winter season. Practically all of them are much below the average school children of even years in both mental and physical development. There ought to be much stricter supervision regarding their school attendance in the marsh districts, and of their living supervision. In many cases they and their families have been more or less charges on the city and people of Kenton during the winter season. In addition to this, many Kenton youths and girls have worked in the fields in the summer season, but Professor H. does not believe that these have been detrimentally affected. They do not let the work interfere with school attendance. He believes, however, that there is every opportunity for making bad associations in the districts because of the general reputation of low *morale* which obtains there. He believes that the State Board of Health, or some similar body, should adopt strict rules concerning this form of employment which will redound to better citizenship of these child workers. He refers especially to the children of parents who live in the marshes themselves and who migrate to the marshes, or to the neighboring towns, during the work season. He blames the parents, rather than the employers, for conditions. He believes that ideals are much too low and that conditions are equivalent to child labor in the cotton industry in the South largely through parental coercion. He is much surprised that there is no law covering the health, welfare and morals of children in this industry in this state.

I also consulted Mr. J. S., Kenton, Ohio, an employer in the marsh districts and a commission merchant. Mr. S.'s opinions were practically the same as those above stated by Professor H. He blames the character of the people who come from the mountainous districts of Kentucky each year to engage in this work. He says that by all means these Kentuckians should be scattered from the marsh and discouraged from returning. It would be best for them and for the community because of the way in which they live in the marshes. Their children have very little opportunity for moral, or mental development, due largely to parental coercion, lack of proper influences, and to their migrating back and forth to Kentucky in the spring and autumn,

thus interrupting their schooling as well. Conditions were much better before this class of workers came into the district.

At McGuffey I conferred with Mr. W. E. B., who is an employer and owner; with Mr. A. E., who manages several thousand acres and is an extensive employer; with Mr. T., who is manager for a large tract belonging to the New York Coal Company, and with many others. All persons with whom I consulted, testified to the low *morale*, particularly in the matter of language, use of intoxicants, and tendency to quarreling and fighting of a considerable percentage of those who occupy the marsh districts. Inquiries about the town, among women and men inhabitants, showed that very few of those who lived out in the marshes were ever seen at the churches, or Sunday schools. It was stated that there were upwards of 3000 persons engaged in the muck lands. Of these about 1200 were said to be natives of Eastern Kentucky, mostly from the Big Sandy River district. They come in the spring, bring large families with them, work by the day, get paid by the week, the head of the family usually collecting the wages for the whole family, in some cases a man being able to make, it is said, as high as \$12.00 to \$15.00 a day by having his whole family at work. No particular hours are exactly followed, but as a rule 10 hours a day obtains, with a noon recess from one-half to one hour. Some heads of families are more ambitious than others. It is not the rule in this district to have luncheon periods in the middle of the forenoon, or the afternoon, so that the work is continuous for spells of four hours at a time. A brief rest is usually taken at the end of the rows while weeding. Wages were found to be considerably better in this district than any other of those previously visited. A child who could keep up with the group and weed one row was paid the standard price of 50¢ per day, one who could weed two rows was paid \$1.00 per day, one who could weed three rows by straddling the middle row and also picking the row on each side, could make \$1.50 per day. The best workers were said to be from 12 to 16 years of age.

A large percentage of these people live in shacks, and practically anything they can get to house them in the various parts of the marsh, at some points from 5 to 10 miles from town (McGuffey). It was stated that the chief diet of the Kentuckians appeared to consist of biscuits and white corn meal with some bacon. It was claimed that drunkenness was a frequent feature, even in McGuffey (which has no saloon) particularly over Sunday, and that the police force of McGuffey had frequent encounters and considerable difficulty in maintaining order. While fights were frequent, it was said that no deaths had resulted directly therefrom. Sometimes youths much below sixteen years of age used alcoholic liquors, but this was infrequent. Intoxicants were obtained from neighboring towns. Only two marriages were said to have taken place among the Kentucky element in the marsh district during the past four or five years of their presence there. Home furnishings were said to consist of the most meagre trappings. In some instances families had practically nothing but onion crates, which they arranged for tables, chairs and beds, using a sheet-iron stove for cooking purposes. Hence, housing conditions are, as a rule, of the most primitive type, excepting in some instances where large owners provide substantial structures. Dr. E. stated that he had seen instances of 25 to 27 persons in a shack consisting of two small rooms downstairs and a half attic upstairs. The villagers testified that sometimes three or four families all lived together. As a rule, there was little privacy for adolescent girls or women. The woman of the house, according to Mr. B., customarily prepared the meals, then proceeded to the fields with her smaller children about 8:00 a. m., worked until the noon hour, left a little early to prepare a lunch and returned to the fields shortly afterwards, when she worked until a half hour or so before the evening quitting time, after which she prepared the evening meals, the younger children following her. No Saturday afternoon holidays are recognized. Work is more or less interrupted by weather conditions. Villagers stated that it was sometimes necessary to work over Sundays and holidays, depending upon the rate of growth of the weeds.

Dr. E. said that he had had from 20 to 22 cases of typhoid fever last autumn among the marsh dwellers and 12 cases this past spring. There were

none at present he thought. One series of his typhoid cases occurred along a certain ditch, or road, called Flat Branch Road. He also knew of some instances of sore eyes, probably trachoma. There was some little trouble from sore knees which he considered insignificant. Among the married women there had appeared in the last year or two an unusually large percentage of occiput-posterior presentations at labor. These occur both among those who live in the town of McGuffey and among those who live in the marshes. Tetanus, or lockjaw, was no factor. In the family of one J. R., he had had 8 cases of pneumonia this past winter, which appeared almost contagious in type, coming one after the other. He could not say, however, that the work was any factor, but it was probable that housing and ventilation questions were the chief predisposing factors.

It was said that the drinking water supply in the marsh district was from drilled wells. Privies were placed over ditches, but many times persons, including women and girls, simply retreated to the growth of horse-weeds, etc., in the vicinity. Villagers also stated that a certain well at "Sage Town" had, they thought, been the source of much typhoid fever.

While I, personally, saw no cases of sore eyes, because of my inability to get out into the marshes and to see many of the inhabitants, because of the flooded conditions, I was informed and given the name of at least one family who were all said to be suffering from this condition. Inasmuch as the Kentuckians come from a district in that state where trachoma is known to be very prevalent, it is quite likely a certain amount of this disease is present among them in the Scioto Marsh districts.

Mr. B. stated that children from 8 years of age up might work, but that there were usually not many under 10 years of age; that it was no longer necessary to bring help over from Kenton, although a few years back it was customary to run wagons back and forth to that city, a distance of about 10 miles, for help, composed largely of minors; that but three of the Kentucky families have remained in the town of McGuffey; that the season for weeding begins in May and is usually over in this district by the Fourth of July, after which there is a limited amount of work for children until September; that from about the first of September until the middle of October, they pull onions and head the same; that it requires from 7:00 to 9:30 for a gang to go up one tier of rows and come back another to the starting point so that four rounds make an ordinary day's work; that there are a good many small contract truck farmers in the district who have big families and regulate their own hours and meals; that many of the women chew tobacco, but they do not drink alcoholic liquors as a rule.

Mr. A. E. was of the opinion that the State Board of Health had best let the subject of child labor alone in these districts, but do what it could to raise the tenor of morals and attend to *general* health problems in the vicinity.

Practically all adults spoken to among the employers, and the physicians, considered the work healthful for children. Dr. E. stated that there was no more sickness among the marsh workers than among town folks who were not so engaged.

One of the land owning syndicates has a large two-story boarding house about a mile out of town where are housed a group of male negroes who work by themselves, usually in the hemp fields. These quarters seemed satisfactory from the exterior, although they could not be reached directly on account of the flood. There were, however, no minors, it was said, among them. At the time of my inspection all houses in the marsh district, which were visible, were standing in one or two feet of water. This was ascertained by climbing up about 8 feet high on a cement mixer on a state highway under construction at a point about a mile south of McGuffey. This point is near the center (east and west) of the entire district. As nearly as I could ascertain, the present flooded condition of the district has caused no case of actual suffering, but I should fear an epidemic of typhoid fever.

One point should be noted. While there is a tendency to blame the marsh dwellers for the hovels in which they live, there is nothing more substantial furnished by the owners, for many of them and, as they own no land themselves and only stay for a few months out of the year, they do not

invest in living quarters nor in furniture. Furthermore, but few of them can live in town, (at McGuffy) since the distances to work are a matter of from one to ten miles, and hence a great waste of time in going back and forth. Furthermore, town houses are at a premium and there is evidence of much crowding into small dwellings in the town itself.

The school at McGuffy has six teachers and includes a high school of the second grade. Upon inquiry I found that none of the teachers lived at McGuffy. The superintendent, Mr. W. E. H., lives at Ada, about eight miles north. One teacher lives about one and one-half miles north of town.

Conversation with boys about the village showed that practically all youths, who were old enough to distinguish vegetables from weeds were employed, as occasion demanded, in the various fields. Some children as young as five years old stated that they had worked for various employers, whose names they gave. For these younger ones, however, there was no evidence to show that they did more than an occasional day of work now and then. Some youths said that besides being allowed no A. M. or P. M. lunch periods, some employers do not allow rest at the end of rows, while it is customary for older children to turn back and help those who have not been able to keep up; that all is a matter of who is the boss or overseer; that school attendance is a secondary matter when it comes time to go to work in the fields; that sore knees are a feature, especially in hot dry weather; that the heat is the most objectionable feature about the work; that breathing dust and getting the same into the eyes is the next most objectionable feature; that stooping postures and getting "awful tired" at times seems to be about the third; that girls in the vicinity may, or may not, wear overalls; that there is "lots" of bad language, especially among those who live in the marshes, although the presence of girls and women is usually respected. (The above testimony was secured from eight or ten boys who were consulted in various places about the town.)

* * * * *

There are other districts in the state where minors are employed at employed at similar work, but the districts visited included small places, as at Kent, Ravenna and vicinity, single large plants, as at Lodi, and the major district at McGuffy. There is no reason to believe that conditions in other districts vary to any extent from those herein reported upon.

PERSONAL EXPERIENCE.

My own special experience, which has consisted of three months on a truck farm of this character near South Chicago when I was 24 years of age, convinces me that this form of work may be exhausting, depending altogether upon the speed which it is attempted to maintain, the temperature of the work day, the length of the day, the age and physical prowess of the individual and the frequency of rest periods, as well as the distance it is required to walk, or travel, to get to the place of work. In dry times, also, the dust may be extreme. It is to be remembered that the posture for work is a constantly stooping-over one, or one of crawling throughout the greater part of the season, which lasts from four to six months.

CONCLUSIONS.

My general conclusions are as follows:

(1) The work required of minors on truck farms, onion and celery fields, and in places of similar character, is too strenuous for normal children under ten years of age, because of the constant application without sufficient variation of process; because of constant abnormal postures it is necessary to assume which may seriously affect the future development of the spine and the chest; because of the tendency to stunting the growth, due to fatigue toxins produced during exhaustion and to the damaging effects of heat toxins produces as a consequence to thermic fever which usually accompanies work under conditions of heat; and, because neither mentally or physically are children below this age adapted in a physiological sense for work requiring constant application.

(2) The work may be indulged in, I believe, without serious detriment to future health for a period of not over eight hours a day, interrupted with

rest periods and lunch hours as described, for instance, in the Lodi district, for children between ten and twelve years of age, provided they secure a certificate of physical fitness from a licensed physician and do not exceed forty-eight hours in any one week. The hours should be shortened, or the work temporarily abated during very hot days, or the hot periods of the day.

(3) The work is probably not detrimental to health for youths of either sex from the age of twelve years up, for a period of ten hours a day, interrupted by rest periods as above described, provided they do not exceed fifty-four hours per week, and, also that they secure a certificate of physical fitness and that attention be given to curtailing the work, as above described, during heated periods.

(4) I am of the opinion that the long walks, or long drives, to and from the places of work should be considered part of the work day and that work hours should be arranged accordingly for minors who are so subjected.

(5) There should be a careful supervision of the drinking water supply including frequent bacteriological examinations. No water should be used for irrigation purposes which may in any way become contaminated by human feces. Sanitary privies, either of the removable-receptacle type, or of the stationary-receptacle type (see U. S. Public Health Service types recommended by Lumsden, Roberts and Stiles) should be provided, both for the protection of the workers in these districts and for the protection of the purchasers and users of vegetables grown in these districts.

(6) As to the general welfare and morals of minors, which it is also required that the State Board of Health investigate, it is my opinion that for children working under restrictions as above stated, this form of employment should be considered productive of thrift, ambition and good habits. The laws regarding school attendance should, of course, be carefully observed. Employers and overseers should be made directly responsible for the moral supervision of minors who work under them throughout the period of the work day, while community, police and social organizations should supervise this matter in periods outside of the work day.

HAY-FEVER-PRODUCING WEEDS IN THE UNITED STATES.

W. SCHEPPEGRELL, A. M., M. D., NEW ORLEANS, LOUISIANA,
President American Hay-Fever-Prevention Association.

Some weeks ago, the American Hay-Fever-Prevention Association published through the press its General Instructions regarding the prevention of Hay-Fever. These directions avoided any reference to the general or local causes which form the predisposing factor to Hay-Fever, but were directed to the destruction or avoidance of the noxious weeds whose pollen form the exciting cause. They were limited moreover to the fall or most common type of Hay-Fever, commencing from the first part of July to the end of August and lasting for about six weeks or until frost or maturity arrests the pollinating process.

The chief cause of the fall Hay-Fever is the pollen of the two varieties of Rag-Weed. While the Instructions aroused a great deal of interest and were utilized even by some of the State Boards of Health, there was found to be an unexpected ignorance in most sections as to what constituted the "Rag-Weed." To meet this demand for information, the American Hay-Fever-Prevention Association has prepared illustrations of both varieties of Rag-Weed, which, with the following descriptions, will enable any one to identify these noxious weeds.

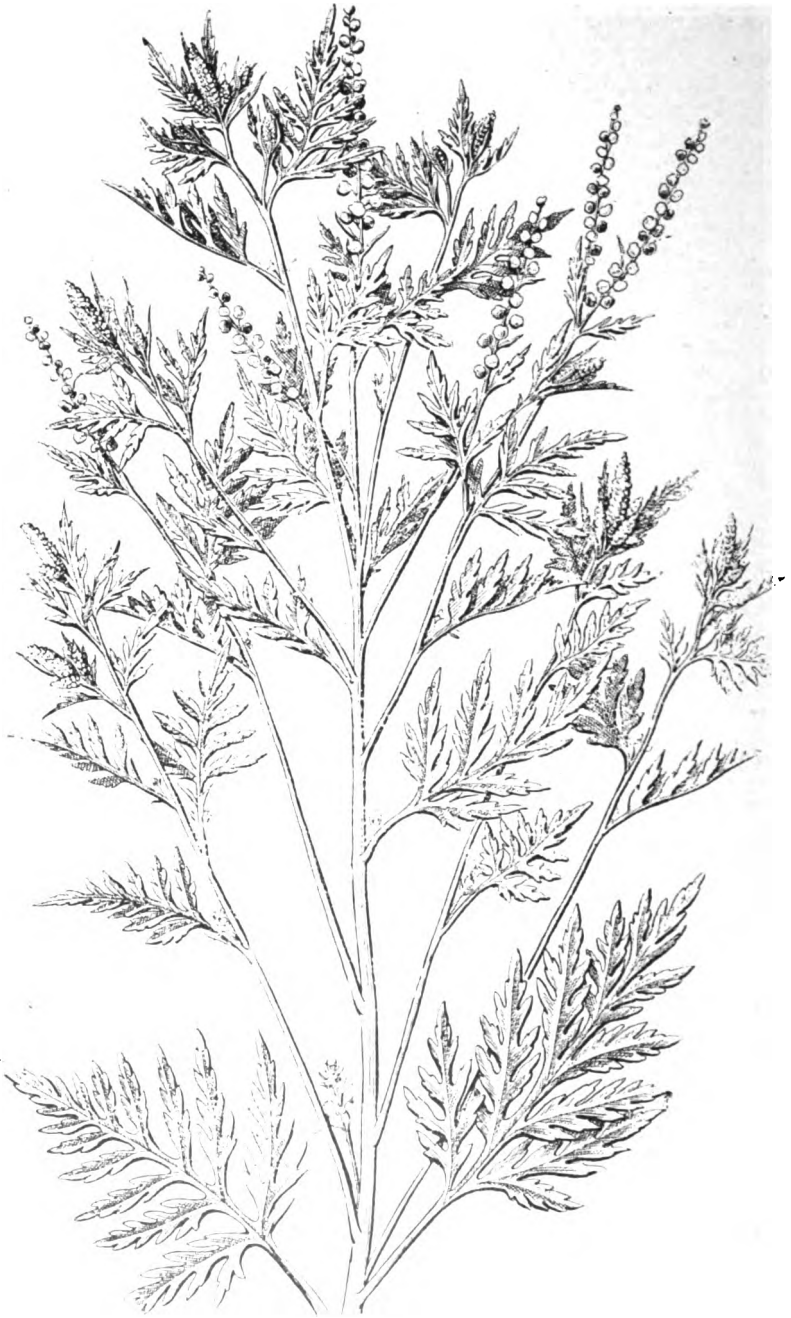


FIG. 1

WORMWOOD RAG-WEED (*Ambrosia artemisiifolia*). Responsible, with the GREAT RAG-WEED, for 25 per cent. of Fall Hay-Fever. More common in the Northern States.

The generic name of the two Rag-Weeds is *Ambrosia*. As Dr. Gray states, "this is ill-chosen for these worthless and coarse weeds." The common or wormwood variety (Fig. 1) is called "*Artemisiifolia*" on account of its leaves resembling those of the wormwood (*Artemisia*.) It is an annual with leaves much cut and thin, opposite and alternate, as shown in the illustration. It has spikes of green flowers (staminate) at the end of the branches. The pistillate or fertile flowers are at the intersection of the branches with the stalks. It resembles the common wormwood, which however bears small insignificant white flowers.

In the Middle and Northern States, the wormwood Rag-Weed is by far the most frequent, being especially prevalent in neglected fields, yards and road-sides. It is usually found in fields where a crop of wheat, rye or oats has been harvested in early summer and afterwards neglected. It grows from one to five feet in height.

The great Rag-Weed (Fig. 2) is called "*Trifida*" on account of its large three-lobed leaves. It is the tallest member of the composite group, and frequently grows to a height of twelve feet. It has a stout stem with a frost-like pith. The insignificant greenish flowers form a terminal pointed cluster, which are staminate (male.) The pistillate flowers, like the wormwood variety, are located near the stalk. It is common in moist soil and, in the low-lands near the Gulf Coast, forms about 90% of all the Rag-Weeds. In the drier interior sections of the country, the reverse is the case.

The irritating principle of both Rag-Weeds is formed in the spike-like flower, being yellowish in color, and almost as light as smoke. It is so abundant that during the stage of pollination it will stain one's clothes yellow while passing through such a field. It is so extremely light that it is almost impossible to collect any amount of it without its being blown away.

Instead of the pollen of the Rag-Weed being used directly for fertilization through the agency of insects, as is the case with most plants, nature has created an immense amount of pollen so that it can be carried by the wind to the distant pistillate flower. The pollen is so abundant that if the Rag-Weed is struck during the active stage, the pollen will come off so freely that it is called "smoking" by many farmers.

The seed is about 1/20 inch in diameter and is formed in the pistillate flowers. They are solid and are not easily carried with the wind. Were the seed wind-blown like those of the thistles, eradication would be much more difficult.

Laboratory investigators have isolated a large number of plants whose pollen will produce the characteristic reaction of hay-fever; but, from the stand-point of the practical sanitarian, we must give our special attention to those pollens that are naturally found in the atmosphere in sufficient abundance to produce the symptoms of hay-fever. The Golden Rod, for instance, has been accused of being responsible for 50% of all cases of hay-fever. The committee on Original Research of the American Hay-Fever-Prevention Association has demonstrated the fact, however, that the Golden Rod belongs to a group of only 15% of cases that do not owe their origin to the Rag-Weed.

An obvious reason for the Golden Rod not being responsible for a large number of cases is that its pollen is not wind-blown, but heavy and tenacious, so that the majority of patients are affected only in the event that the nostrils

**FIG. 2**

GREAT RAG-WEED (*Ambrosia Trifida*), whose pollen is one of the chief causes of Hay Fever. Grows in moist lands. Very abundant on the Gulf Coast.

are placed in close proximity to the flower. The pollen of the Rag-Weed, however, is easily detached in clouds and is distributed by the wind over a large territory. Besides, the usual attacks of fall hay-fever sufferers are co-incident with the pollination of the Rag-Weed, while the Golden Rod frequently blooms for weeks after the attacks have subsided.

The most active stage of the Rag-Weed is in the month of September and every effort should be made at this time to destroy these noxious weeds. This will not only be a source of relief to hay-fever sufferers sensitive to these pollens, but will prevent the formation of the seed, which will produce the weeds in great abundance the following year.

The object of the American Hay-Fever-Prevention Association is the dissemination of general knowledge of benefit to sufferers from hay-fever, the education of the public regarding the weeds that are known to produce this disease, and the use of its influence and co-operation towards the eradication of such weeds. By means of lectures and articles in the scientific and public press, it is endeavoring to educate the public in the relation of certain weeds to hay-fever, and the best methods for their avoidance and eradication.

One aim of the Association is to see that this important matter is treated with the respect and consideration which it merits. A malady, with which hundreds of thousands are afflicted, which has among its complications many catarrhal diseases, asthma, bronchitis, infections of the cavities of the head and ear diseases, and which is so depressing in its effects on the nervous system that even many cases of suicide are attributed to this cause, justly demands the most careful and dignified consideration.

Malarial fever, in recent years, has been enormously diminished by preventive methods, such as draining swamps; typhoid fever has been decreased through the care taken in the water supply, and the destruction of infected material; tuberculosis and other diseases have found their advocates for preventive methods. The American Hay-Fever-Prevention Association has instituted, directly and through its affiliated State Associations, a campaign of education regarding the hay-fever producing weeds, which it is hoped will in a few years destroy the cause of this wide-spread disease.



EDITORIAL SECTION.

An Investigation of Public Health Administration in Toledo.

Recently Surgeon Carroll Fox of the United States Public Health Service, has completed a survey of the activities of the health department in Toledo. The survey was made at the request of the State Department of Health, the Toledo Board of Health and the Toledo Commerce Club, and occupied four months. A new charter has been adopted by the citizens of Toledo, and under its provisions the health administration will comprise a division of the department of public welfare. Dr. Fox directs attention to the importance of public health work and suggests that a department of health be created instead of a division. This would be only a just recognition of the importance of this work, and by combining a number of the present agencies concerned in health administration, a large but well-organized department could be formed. Equally rational is Dr. Fox's recommendation that the sanitary police force be reduced to five men, in order to have a larger proportion of the health appropriation available for more useful lines of work. To compensate for the lessened number of sanitary inspectors, the co-operation of the police force could be secured. Dr. Fox was struck with the inadequacy of hospital facilities for isolation purposes and for cases of tuberculosis, and recommended the erection of a four hundred bed hospital to supply this need, such hospital to be under the direction of the health department.

The high typhoid rate in Toledo before and since the installation of a satisfactory public water supply is commented upon by Dr. Fox. He suggests the addition of an experienced epidemiologist and a number of public health nurses to the staff to aid in combatting this problem. He also recommends that all surface wells within the city be eliminated, stating that when a municipality has gone to the trouble and expense of providing a pure, safe public water supply, this is the only rational step. The abolition of all catch basins and privy vaults within the city is also suggested, and it is only necessary to enforce the state code and municipal ordinances to accomplish this. A radical recommendation made is that council provide money to install plumbing in houses where the people can ill afford to pay for it, the expense so incurred to be a lien against the property.

Recommendations were also made regarding a better system of garbage collection, the provision of disinfectants for typhoid cases, cultural release of diphtheria cases, further educational work by the department, and more publicity for the dairy and milk regulations.

The last recommendation made by Dr. Fox was that 15 per cent of the available revenues of the city be appropriated for purposes of public health and sanitation, \$75,000 for the health department, and \$217,500 for the department of service, the latter amount to be used for the collection of garbage, ashes, and rubbish, street cleaning, and comfort stations. A survey of this kind is of great value to any city. A disinterested and expert outsider views the organization of the health department in an entirely different light from those on the inside. The faults which have been softened by long association appear glaring to the newcomer, and lines of work which have never been

taken up because their possibility has not been revealed to the department, are at once manifest to the investigator. The recently appointed health officer of Toledo is already attempting to put some of the recommendations of Dr. Fox in force. It is to be feared that the awakening of an enlightened public opinion is necessary before sufficient funds will be provided to carry out all the suggestions made by Dr. Fox for the improvement of public health administration in Toledo.

* * *

Efficient Cooperation in Health Legislation.

To one who reads the first report of the Executive Council of the Ohio Public Health Federation there comes the conviction that a more striking example of efficient co-operation between voluntary organizations with allied purposes has never been offered in Ohio. The report covers the five months' session of the 81st General Assembly and records the efforts of the Federation to secure the enactment of laws designed to promote the public health welfare of the state and to oppose laws which could not be considered in such light.

The Executive Council is composed of representatives of seven voluntary health agencies and three state boards, officially interested in health matters. There are 890 local co-operating committeemen to whom regular bulletins were sent regarding health bills. The function of the local committeemen was to present arguments for or against health bills before the legislature to his own representative and senator. The result of this organized effort was that *nine* bills which the Federation endorsed were enacted into law, *eight* which it went on record against were defeated and *five* which it endorsed failed of enactment.

The success or failure of the Federation and the consequent effect upon the health and happiness of the people of Ohio was dependent entirely upon the activity of the local committeemen. That it was a success, the report speaks for itself. It is planned to continue the Federation as a permanent organization to aid in a better working-out of the many perplexing problems that are constantly arising in the field of public health work. A limited number of copies of the report are available for distribution and can be had by writing the State Department of Health.

* * *

Attendance at Conferences of Boards of Health.

Not infrequently the State Health Department receives a complaint from a health officer or member of a board of health that an examiner from the Bureau of Inspection and Supervision of Public Offices has made a finding against him because of attendance at a conference of boards of health. This finding has usually been made against the health officer on the ground that the board of health is only entitled to send one delegate to the conference and when a member of the board attends it is as delegate.

Some years ago the Bureau was consulted in regard to the representation of boards of health at conferences and after advising with the Attorney General the decision was reached that although the law provides for one delegate there was no legal objection to sending the health officer to a conference, following the usual rule that any administrative body may send a repre-

sentative any place where definite information of value in the administration of its functions may be procured.

The announcements of conferences of boards of health have continuously carried this information. Recently complaint was received from a township health officer to the effect that a state examiner had made a finding against him and instructions had been sent the prosecuting attorney to recover amounts paid during three years for expenses incurred in attending conferences to which he was sent by the township board of health.

Information was secured as to the name of the inspector, the dates and amounts and the matter was taken up with the deputy supervisor. After an investigation the department was informed that the announcement as sent to boards of health was a correct interpretation of the orders given to state examiners and that there would be no further annoyance from this source.

With this additional assurance as to the validity of such expenses it is hoped that the attendance at future conferences will be increased. As a word of caution it is to be said that in all cases the records of the board of health must show that a delegate was appointed and where the health officer is also sent the records must show that he was instructed to attend the conference. Without such instruction a health officer would not be authorized to attend a conference except in cases where he is appointed to serve in place of a board of health in a village.

* * *

Improvement of Water Supplies by Order of the State Board of Health.

A court decision of interest to those municipalities of Ohio that have been ordered by the State Board of Health to install public improvements will be found in a journal entry of the Court of Appeals of the Seventh District sitting at Jefferson, Ohio, August 31, 1915. The style of the case is: State of Ohio ex. rel. Ben L. Bennett, City Solicitor of the city of East Liverpool, Ohio vs. J. S. Hilbert, C. N. Brannan, J. F. Adams and C. A. Cavanaugh, Deputy State Supervisors of Elections of Columbiana County, Ohio.

The decision follows:

This day this cause coming on to be heard on the amended petition of the Relator making application for the allowance of a writ of mandamus herein, and on the answer of said defendant, the reply of said relator, the evidence adduced, and the arguments of counsel, and on consideration thereof, the Court, being fully advised in the premises, finds that, as alleged and set forth in relator's petition, the State Board of Health, of the State of Ohio, on the Twenty-sixth day of June, 1913, duly ordered the city of East Liverpool, Ohio, to install a water purification plant satisfactory to the State Board of Health prior to January 1, 1915, and that both the Governor and Attorney General of the State of Ohio, on July 22, 1913, duly approved said order.

That, as alleged and set forth in relator's petition, the State Board of Health, of the State of Ohio, on March 24, 1915, duly passed an amended order whereby said State Board of Health ordered the city of East Liverpool, Ohio, to install and have in operation a water purification plant satisfactory to the State Board of Health, within eighteen (18) months from the date upon which said amended order was approved by the Governor and Attorney Gen-

eral of the State of Ohio, and that said amended order was approved by the Governor and Attorney General of the State of Ohio, March 26, 1915.

That, as alleged and set forth in relator's petition, the council of the city of East Liverpool, Ohio, on the 31st day of March, A. D. 1915, duly passed an emergency ordinance to issue bonds which said emergency ordinance contained the following section:

"Section 9. This ordinance is hereby declared to be an emergency ordinance or measure, necessary for the immediate preservation of the public health and safety in said municipality of the city of East Liverpool, Ohio, and shall go into immediate effect. The reason for said necessity is the fact that the water supply of said city is impure and dangerous, detrimental and injurious to the health, safety and welfare of the inhabitants of said city".

The Court further finds that at the time of the passage of said ordinance, to-wit, on the thirty-first day of March, A. D. 1915, an emergency did then and does now exist and that it then was necessary that said council pass said ordinance for the immediate preservation of the public health and safety in said municipality of said city of East Liverpool, Ohio; that said ordinance went into immediate effect and is not subject to the referendum and that the reason for such necessity then was and now is the fact that the water supply of said city then was and now is impure and dangerous, detrimental and injurious, to the health, safety and welfare of the inhabitants of said city.

The Court further find, upon the issues, for the defendants, and find that the relator is not entitled to a writ of mandamus against said defendant for the reason that the Board of Health of the State of Ohio ordered said city of East Liverpool, to make certain improvements in and to its water works department and that said ordinance number 1424 which was passed in order to secure the funds necessary for the purpose of carrying out the provisions of said State Health Board's order was an emergency ordinance or measure that it went into immediate effect and is not subject to referendum.

It is therefore considered and ordered that the relator's petition be dismissed and that the defendants go hence without day, and that said relator pay the costs herein.

* * * * *

Marked Decrease in City of Hamilton's Death Rate for 1914.

The annual report of the Hamilton Board of Health for 1914 shows that a death rate from all causes of 10.09 per thousand population was recorded for the year as compared with rates of 16.49 and 16.11 for the years 1913 and 1912 respectively. According to the report, the comparatively low rate for 1914, 10.09, is figured on the basis of the liquor license census of 39,160 population, a slightly larger population for the city than the official midyear census estimate gives. With the rate figured on the basis of the Bureau of the Census July 1, 1914 estimate of 38,814 population, the death rate would be only slightly higher, 10.15, a very considerable reduction from rates of previous years.

With tuberculosis responsible for a total of 29 deaths in the city in 1914, as compared with 51 in 1913, it is to be hoped that this decrease will be maintained through the successful operation of the visiting nurse service and the tuberculosis clinic and dispensary work. A comparative table giving the num-

ber of reported cases of certain communicable diseases discloses the fact that three times as many cases of tuberculosis were reported in 1914 as in 1913, which is certainly indicative of stronger efforts by the Department of Health and improved cooperation on the part of Hamilton physicians in the initial attack upon this disease. The regularly employed Board of Health nurse and the visiting nurse maintained by the Federated Charities assisted in the tuberculosis clinic and dispensary which was operated during 86 days of the year and was visited by 156 persons on 555 occasions.

Two important announcements for the future success of public health work in the city should be noted in the annual report. The first states that a permanent office for the Department of Health has been provided, and the second, that funds have been appropriated for the establishment of a laboratory.

SOME INTERESTING FIGURES.

Deaths from Tuberculosis in Ohio.

Total, 1910-1914 inc.....	34,171
1910	7,179
1914	6,564
Pulmonary, 1910-1914 inc.....	28,918

Estimated Population of Ohio July 1, 1910.....	4,779,981
July 1, 1914.....	5,026,898

Anti-Tuberculosis Societies in Ohio, 1910.....	23
Public Health Organizations in Ohio, 1914.....	60
Tuberculosis Hospitals in Ohio, 1910.....	10
1914	15
Anti-Tuberculosis Nurses in Ohio, 1910.....	26
1914	110
Visiting Nurses in Ohio, 1910.....	100
1914	300
Free Tuberculosis Clinics in Ohio, 1910.....	9
1914	21



AUGUST MEETING OF THE STATE BOARD OF HEALTH.

The monthly meeting of the State Board of Health was held in Columbus August 12, 1915.

In response to citations there appeared before the Board, officials of the villages of Dennison and Uhrichsville to show cause why necessary improvements should not be installed to correct the pollution of Little Stillwater Creek. A conference was held by the Secretary and Chief Engineer with these officials prior to the time of meeting and an agreement was reached and a statement prepared for presentation to the Board. On consideration of this agreement between the representatives of the Board and officials from Dennison and Uhrichsville, it was agreed to defer until October, 1916 consideration of the issuance of orders under Section 1251 of the General Code requiring a correction of the pollution of Little Stillwater Creek by sewage from these villages. The Board voted to require each village to have made a thorough sewerage survey and have prepared plans and estimates of cost for the collection and disposal of sewage, such plans and estimates to be submitted to the State Board of Health prior to October 1, 1916.

The minutes of the July meeting and the Secretary's monthly and financial report were submitted and approved.

The State Board of Health adopted the following rules and regulations for the government of tuberculosis hospitals or sanatoria as provided in Section 3147 of the General Code.

1. The county commissioners or board of trustees of each and every county or district tuberculosis hospital in Ohio shall file an annual report with the State Board of Health as provided in Section 3153 of the General Code of Ohio and shall make such other reports as may be required from time to time by the State Board of Health.

2. An annual inspection and such other inspections as may be ordered of each and every county and district tuberculosis hospital in Ohio shall be made by the State Board of Health through its duly authorized representatives.

3. A certificate of approval signed by the Secretary and Executive Officer and stamped with the official seal of the State Board of Health shall be issued annually to each and every county or district tuberculosis hospital in Ohio, when it has complied fully with the laws governing such hospitals, the rules and regulations of the State Board of Health, and when the annual inspection indicates that such hospital is being conducted in proper manner.

4. The medical superintendent or other responsible officer of each and every county or district tuberculosis hospital in Ohio shall adopt a set of rules and regulations for the internal management of his institution. Such rules and regulations shall not become effective until a copy of said rules and regulations has been filed with and received the approval of the State Board of Health.

5. Any new district or addition to a district shall be approved by the State Board of Health as provided in Section 3148 of the General Code of Ohio and a formal application for such approval must be made to the State Board of Health.

6. The State Board of Health shall be notified within twenty-four hours of every application for admittance of a patient received by the medical superintendent or other responsible officer of each county or district tuberculosis hospital.

7. The State Board of Health shall be notified within twenty-four hours of every death, immediate discharge for cause, or voluntary leaving of patient who has been admitted to each and every county or district tuberculosis hospital.

8. The State Board of Health shall be notified at least two weeks in advance of each and every contemplated discharge of a patient by the medical superintendent or other responsible officer of each and every county or district tuberculosis hospital.

9. Each and every county or district tuberculosis hospital in Ohio shall employ not less than two graduate nurses—one on day duty and one on night duty—who shall give their time to the professional care of patients within such hospital.

10. All reports, annual or otherwise, applications for approval and notifications required by these Rules and Regulations shall be made on blank forms furnished by the State Board of Health.

The State Board of Health adopted the following rules and regulations for the prevention of blindness from inflammation of the eyes of the new born, the rules and regulations to become effective August 20, 1915.

1. Every physician, surgeon, obstetrician, midwife, nurse, maternity home or hospital required to report to the local health officer the condition defined as inflammation of the eyes of the new born, in an act entitled "An Act for the prevention of blindness from inflammation of the eyes of the new born, designating certain powers and duties and otherwise providing for the enforcement of this act," passed May 19, 1915, shall make such report in writing. Said written report shall give the name and address of the reporting physician, surgeon, obstetrician, midwife, nurse, maternity home or hospital, the name, sex, age in days and address of the infant afflicted with inflammation of the eyes of the new born, together with the name of the mother of such infant, provided that in the case of any unnamed infant, so afflicted, the designation "Unnamed" shall be written in lieu of a given name.

2. If, in the opinion of the reporting physician, surgeon, obstetrician, midwife, nurse, maternity home or hospital, the conditions of the case so require, in addition to the written report, an immediate notice of such case shall be given to the health officer in the most rapid manner available.

3. Upon receipt of a written report of a case of inflammation of the eyes of the new born, the local health officer shall immediately write on the report the date and hour of the receipt of the report together with his own signature, and shall make a permanent record of the case for the use of the local health department. The original written report shall be thereafter forwarded at once by mail to the State Department of Health.

4. Parents, relatives and other persons required to report a case of inflammation of the eyes of the new born shall make such report to the health officer in the most rapid manner available. Each case so reported to the health officer, and any other case coming to his attention otherwise than by the written reports as provided above, shall be reported in writing to the State Department of Health by the health officer. Such report from the health officer shall give the name and address of the person who first notified the health officer of the case, or a statement as to the health officer's source of information concerning the case, together with the name, sex, age in days and address of the infant afflicted with inflammation of the eyes of the new born and the name of the mother of such infant, provided that in the case of any unnamed infant so afflicted the designation "Unnamed" shall be written in lieu of a given name.

5. The local health officer shall forward by mail to the State Department of Health on blanks provided for the purpose a report of the investigation and history of each and every case of inflammation of the eyes of the new born reported to him or coming to his attention, said report to be submitted as soon as practicable.

6. Between the first and sixth of each month, the Secretary and Executive Officer of the State Board of Health shall certify to the Treasurer of State the name and address of every physician, surgeon, obstetrician, midwife, nurse, maternity home or hospital from whom one or more, the number to be specified, written reports of cases of inflammation of the eyes of the

new born submitted in full compliance with statute and rules and regulations of the State Board of Health, have been received by the State Department of Health during the preceding month.

The Secretary presented a report in regard to the employment of minors on truck farms near Lodi, Kent, Ravenna, and the Scioto marsh lands in Hardin County, and recommended that a hearing be granted to operators of these truck farms, those employed in this industry and any other persons having knowledge of the conditions under which children under sixteen years of age are employed on these truck farms, with an idea of reaching an agreement whereby improper conditions may be remedied. The Board adopted this recommendation and authorized the Secretary to arrange for and hold such a hearing.

Plans for a proposed water supply for Brewster, Stark County, were approved upon condition that the village purchase the site for the supply wells and that the village council pass an ordinance prohibiting the establishment or maintenance of any privy vault, cesspool or other source of pollution of the supply within five hundred feet of any of the wells.

Plans for a proposed water supply for the village of Coldwater, Mercer County, were approved with the provision that the village council pass an ordinance preventing the establishment or maintenance of any leaching privy vault or cesspool or other source of pollution within five hundred feet of any supply well and also prohibiting the use of any well within the village as a means of disposing of manufacturing or domestic wastes.

Plans were approved for a public water supply for the village of Maumee, Lucas County, the supply to be derived from drilled wells. The supply was approved upon condition that the council pass an ordinance preventing the establishment or maintenance of any leaching privy vault or cesspool or other source of pollution within five hundred feet of any supply well and prohibiting the use of any well within the village for disposing of manufacturing or domestic wastes. The Board disapproved the feature of the plans that provided for the installation of an emergency intake to draw water from the Miami and Erie Canal and prohibited the installation of such an intake.

Plans were approved for a proposed additional water supply of Xenia, Greene County, to be obtained from drilled wells located above the confluence of Massie Creek and the Little Miami River. The Board approved plans presented by the Xenia Water Company for the water supply of the city of Xenia. A condition is attached that no leaching privy vault or cesspool or other possible source of pollution of the proposed supply shall be established or maintained within five hundred feet of any supply well. The existing source of supply and reservoir at the pumping station are ordered abandoned as soon as the adequacy of the proposed additional supply shall have been demonstrated. The Board withheld action on a proposed method of developing this supply by storing the water in the existing reservoir but will permit the use of this method temporarily pending the provision of a satisfactory development of the new supply if improvements are made immediately to prevent the entrance of surface drainage into the reservoir. Attention is called to the fact that the new supply while of a sanitary quality will prove objectionable on account of the high iron content and that this iron should be removed by a proper deferrization plant.

Plans were approved for proposed sewerage and sewage treatment plant for the village of Centerburg, Knox County. It is required that the sewage treatment plant shall be constructed before connections to the sewers are permitted and that the village council pass an ordinance regulating the proper use of sanitary and storm water sewers and providing for the proper maintenance and operation of the sewerage system and sewage treatment works. It is also required that the filtering material to be used must receive the approval of the Division of Sanitary Engineering and that the capacity of the sewage treatment plant shall be increased if the State Board of Health deems it necessary.

Plans were approved for sewerage and a sewage treatment plant for the Cincinnati Boys Refuge Farm. The city of Cincinnati is required to provide for the proper care and maintenance of the sewage treatment plant in order to insure its efficient operation. Filtering material to be used in the sewage treatment plant must be satisfactory to the Division of Sanitary Engineering of the State Board of Health.

Plans were approved for a proposed intercepting sewer for the city of Cleveland to be known as the Walworth Diversion Sewer. It is required that before this sewer is placed in service a sewage treatment plant of design satisfactory to the State Board of Health shall be constructed near the existing West 58th Street outlet to provide for satisfactory disposal of the sewage.

Plans were approved for sewerage and a sewage treatment plant for Erie Dell Beach, at Euclid, Cuyahoga County. The realty company installing the sewers is required to adopt and enforce regulations to provide proper use of the sanitary and storm sewers and the establishment of connections thereto. It is also required to provide for daily attendance to the operation of the sewage treatment plant and to provide also for the continuous disinfection of the sewage effluent during the bathing season.

The Board withheld granting approval of plans for a proposed new sewage treatment plant for the village of Geneva in Lake County and advised the village authorities that the existing sewage treatment plant is inadequate to prevent a nuisance in the creek receiving the effluent from the plant and that it is necessary to make extensive improvements in the equipment and devices for the treatment of the sewage. An investigation of the plans presented convinced the Board that sufficient study had not been given to the development of a proper method of meeting the conditions now existing and the village officials were advised to give this matter more thorough study and to secure the services of an engineer experienced in designing sewage treatment plants to conduct or to advise in a thorough study to determine the most satisfactory project for the installation of a new sewage treatment plant.

Plans were approved for sewerage and a method of sewage disposal for the Knox County Children's Home. These plans contemplate the installation of a settling tank and leaching cesspool. It is required that the settling tank shall be cleaned at least once each year and that the leaching cesspool shall be abandoned and filters for secondary treatment of the sewage shall be installed when the State Board of Health shall deem this to be necessary.

The Board approved plans for an extension of the sewage system for the village of Woodsfield, Monroe County, with the condition that the village council pass an ordinance prohibiting the establishment of connections to storm sewers for the removal of sewage or other objectionable wastes, requir-

ing the discontinuance and removal of such existing connections to the sewers and permitting connections to storm sewers for the removal of rain water and sub-soil drainage only.

The Board received a report from its Division of Sanitary Engineering on an investigation of complaints of the pollution of Mill Creek and laterals by sewage from the village of Hicksville, Defiance County. The Board found as a result of the investigation that sewage from the village of Hicksville discharged into Mill Creek and laterals has so polluted said water courses as to give rise to foul and noxious odors and to conditions detrimental to the health and comfort of citizens who reside in the vicinity of those water courses. The officials of the village were cited to appear at the next regular meeting of the Board to show cause why they should not install the necessary sewers and a sewage treatment plant to collect the sewage from the village and to correct the pollution of Mill Creek and laterals.

A complaint by the trustees of Hubbard Township, Trumbull County, that the village of Hubbard has polluted Mud Run was presented and referred to the Division of Sanitary Engineering for investigation and report.

The following list of health officers appointed by their respective councils to serve in place of a board of health were approved: J. G. Bennett, Belpre; Alonzo L. Dobbins, Christiansburg; Charles Waits, Fayetteville; Dr. J. F. Shrontz, Martinsburg; Dr. G. R. Hagerman, Mendon; and Dr. C. E. Meckstroth, New Knoxville.

The Secretary was authorized to issue a renewal of the license heretofore granted to the Florence Crittenton Home at Youngstown.

In order to give the State Board of Health an opportunity to investigate the new water filtration plant under construction at Cleveland, it was voted to hold a special meeting of the Board in Cleveland, September 23, 1915.

Regulations governing the sale of ice cream and soft drinks at soda fountains were adopted at the September meeting of the State Board of Health. The matter had been presented to the Board by one of the members at the preceding meeting, and was given consideration during the intervening month.

It was pointed out that the danger of transmission of disease through the common use of unsterilized cups, spoons, and other soda fountain paraphernalia, is considerable. It is hoped that in the interests of the public health the enforcement of these rules will be made effective by the cooperation of the health officers, the general public, and the soda fountain proprietors.

Following are the regulations and the sections of the General Code by virtue of which the state Board of Health acts, together with the letter from the State Health Department, calling attention of health officials to the new rules:

OHIO STATE BOARD OF HEALTH.

DIVISION OF ADMINISTRATION.

To Boards of Health, Health Officers, et al.:

Your attention is directed to the following orders and regulations governing the sale of ice cream, sodas and soda fountain sundries, adopted by the State Board of Health September 23, 1915.

Your attention is also directed to Section 1238 of the General Code which provides that "Local boards of health, health authorities and officials, officers of state institutions, police officers, sheriffs, constables and other officers and employes of the State or any county, city or township, shall enforce the quarantine and sanitary rules and regulations adopted by the State Board of Health".

There is evidence to show that disease has been transmitted by the promiscuous use of unsterilized cups, spoons, dishes, etc. The purpose of these regulations is to remove this source of danger to the public health and your hearty cooperation is solicited.

It is advisable that a copy of these orders and regulations be left with each person owning or operating an ice cream parlor or soda fountain and to provide for this we will send to each health officer as many copies of this circular as he may need.

Respectfully yours,

E. F. McCAMPBELL,

Secretary and Executive Officer.

Columbus, Ohio,
October 1, 1915.

RULE 1. In order that the sale of ice cream, sodas and soda fountain sundries may be conducted under sanitary conditions the operators of ice cream parlors and soda fountains are hereby instructed that all such goods shall be dispensed only in sterile containers. To this end it is ordered that all soda fountains and ice cream parlors be provided with facilities for the sterilization of dippers, glasses, spoons, serving dishes and any other vessel or utensil coming in contact with ice cream, sodas, or soda fountain sundries.

RULE 2. Facilities for the sterilization of dippers, glasses, spoons, serving dishes and any other vessel or utensil coming in contact with ice cream, sodas or soda fountain sundries shall include

- (1) An adequate supply of hot and cold water of a quality suitable for drinking purposes.
- (2) Suitable arrangements for supplying boiling water or live steam.
- (3) An adequate supply of clean towels for drying glasses, dishes, etc.
- (4) Suitable provision for taking care of sterile glasses, dishes, etc., so as to keep same clean until wanted for use.

RULE 3. All dishes and utensils, after each individual service, shall be washed by (a) rinsing in cold water, (b) then thorough washing in hot water with soap or suitable cleansing powder, (c) then exposing to live steam or boiling water for a period of three to five minutes, (d) then rinsing in clean cold water and draining or wiping dry with a clean towel.

In lieu of the above requirements or where it is found impossible or inexpedient to use live steam or boiling water, paper cups or paper tumblers with individual spoons will be allowed for individual use only.

RULE 4. Refrigerators at soda fountains shall be kept clean by washing with hot water and soap or washing powder.

RULE 5. Employees in ice cream parlors and at soda fountains shall be cleanly in person and dress, free from infectious and contagious disease and trained in the conduct of their work.

RULE 6. The use of straws is forbidden except when such straws are protected from dust, dirt and handling by employees or others.

RULE 7. As soon as empty all ice cream containers, milk and cream cans shall be thoroughly rinsed with cold water and covered so that no foreign matter may enter said containers or cans.

RULE 8. The foregoing rules and regulations shall take effect and be in force on and after January 1, 1916.

The attention of the public and of public officials is directed to the following Sections of the General Code:

Section 1237. The state board of health shall have supervision of all matters relating to the preservation of the life and health of the people and have supreme authority in matters of quarantine, which it may declare and enforce, when none exists, and modify, relax or abolish, when it has been established. It may make special or standing orders or regulations for preventing the

spread of contagious or infectious diseases, for governing the receipt and conveyance of remains of deceased persons, and for such other sanitary matters as it deems best to control by a general rule. * * * *

Section 1238. Local boards of health, health authorities and officials, officers of state institutions, police officers, sheriffs, constables and other officers and employes of the state or any county, city or township, shall enforce the quarantine and sanitary rules and regulations adopted by the state board of health.

Section 1247. * * * * The laws prescribing the modes of procedure, courts, practice, penalties or judgments applicable to local boards of health, shall apply to the state board of health and the violation of its rules and orders. * * * *

Section 4414. Whoever violates any provision of this chapter, or any order or regulation of the board of health made in pursuance thereof, or obstructs or interferes with the execution of such order, or wilfully or illegally omits to obey such order, shall be fined not to exceed one hundred dollars or imprisoned for not to exceed ninety days, or both, but no person shall be imprisoned under this section for the first offense, and the prosecution shall always be as and for a first offense, unless the affidavit upon which the prosecution is instituted, contains the allegation that the offense is a second or repeated offense.



FORTY-THIRD CONFERENCE OF BOARDS OF HEALTH.

The forty-third conference of the State Board of Health with representatives of local boards of health held in Dayton, November 11 and 12, 1915. This conference will be for the villages of less than 3000 population (Census 1910) and the townships in the following counties.

Adams	Fayette	Logan	Pickaway
Athens	Franklin	Madison	Pike
Belmont	Gallia	Meigs	Preble
Brown	Greene	Mercer	Ross
Butler	Guernsey	Miami	Scioto
Champaign	Hamilton	Monroe	Shelby
Clark	Highland	Montgomery	Union
Clermont	Hocking	Morgan	Vinton
Clinton	Jackson	Muskingum	Warren
Darke	Lawrence	Noble	Washington
Fairfield	Licking	Perry	

An official announcement of the meeting will be sent to all boards of health and health officers in the above counties. The program of the conference will be completed and sent out in advance of the meeting.

Attendance at conferences has not been as large as it should be but there has been a constant growth and a much greater increase in the interest shown by those in attendance. It is the aim of the State Health Department to make these conferences not only interesting but of value to those charged with the administration of laws and regulations to promote public health and it is to be regretted that we have some public officials short-sighted enough not to appreciate the opportunity offered. Not only are the addresses and discussions of value to the delegates but of greater value is the opportunity to meet and talk with others engaged in the same line of work.

It has been found, by those connected with the State Department of Health, that in communities where attendance at conferences has been the rule health regulations are better and more intelligently administered than in those communities where delegates are infrequently appointed or where no attention is paid to attendance at these conferences.

It is to be hoped that each of the 968 health districts in counties above listed will be represented by at least one person. Special attention is called to another item in this issue of the Journal on "Attendance at Conferences of Boards of Health."

PUBLIC HEALTH ACTIVITIES IN OHIO.

Ohio State Public Health Exhibit.

Following the close of the county fairs on October 7, the Ohio State Public Health Exhibit will be returned to Columbus for repairs. The regular winter routine connected with the Exhibit will be renewed on October 19 when the following proposed itinerary will be undertaken.

Byesville	October 19-22.
Cambridge	October 26-29.
Dayton	November 3-5 (State Conference Charities and Cor- rections).
New Philadelphia.....	November 9-12.
Kent	November 16-19.
Ravenna	November 23-26.
Youngstown	November 30 - December 3.
Warren	December 7-10.
Conneaut	December 14-17.
Cleveland	December 21-31.

Public Health Organizations.

On August 3, a temporary organization of antituberculosis workers was effected in Ashtabula county. Dr. W. S. King was elected temporary chairman and Dr. Mary M. Battels was elected temporary secretary. A meeting to organize on a permanent basis will be held in Ashtabula on September 20th.

Public Health Nurses.

On July 1, the Greenville Public Health League employed Miss Jessie Chapman as permanent public health nurse.

Miss Elizabeth Davison, traveling nurse employed by the Ohio Society for the Prevention of Tuberculosis, has been working in proposed hospital district No. 4, comprising Lake, Geauga, Ashtabula and Trumbull counties, since July 15. A great deal of interest has been aroused and it is hoped a hospital may be established in this district within the coming year. On September 15, Miss Davison resumed her work of visiting the Red Cross Christmas Seal Prize winning cities in Logan.

Miss Janet Worden was employed on July 27 by the Tiffin Committee on Public Health Nursing as permanent public health nurse.

Miss Amy L. Mercer, Cleveland, formerly traveling public health nurse employed by the Ohio Society for the Prevention of Tuberculosis, was appointed on August 15 to the position of public health nurse in charge of tuberculosis hospital admissions and discharges in the Division of Public Health Education and Tuberculosis, State Board of Health.

On August 20, Miss Nellie Blinn was employed by the Jackson Public Health League to succeed Miss Bertha Billiani resigned.

Miss Rose M. Foster, Supervisor of School Nurses, Cleveland Board of Education, was appointed on September 1 to the position of public health nurse in charge of the prevention of blindness and inspection of maternity boarding houses and lying-in hospitals in the Division of Public Health Education and Tuberculosis, State Board of Health.

Tuberculosis Hospitals.

The Joint Board of County Commissioners of District No. 10 have selected a site of 40 acres on the outskirts of Chillicothe where the proposed district tuberculosis hospital will be erected.

It is reported that Mr. Peter Kuntz, Dayton, has selected a site of 40 acres west of that city for the erection of a tuberculosis hospital involving the expenditure of more than a half million dollars. The property will eventually come into the hands of the Sisters of the Poor of St. Francis, who at the present time conduct the St. Elizabeth Hospital.

A joint meeting of the commissioners of Lake, Geauga, Ashtabula and Trumbull counties was held in Ashtabula on August 24 to discuss the formation of a district for the erection and maintenance of a tuberculosis hospital. No definite action was taken, but expressions of opinion seemed to indicate that favorable action will be taken as soon as a plan for financing the project could be worked out.

Ohio Hospital Association Organized.

Heads of fifty private and public hospitals in the state met at Cedar Point for a two day session on August 25-26. They organized the Ohio Hospital Association for the purposes of aiding legislation, standardizing training schools for nurses, to secure more benefits under the provisions of the Workmen's Compensation Act, to help shape the rules governing nurses' registration, and to devise some statewide system for complying with the provisions of the federal law relating to the administration of narcotics.

The officers elected were: President, E. R. Crew, M.D., Dayton; Vice Presidents, Rev. A. G. Lohmann, Cincinnati, Miss Charlotte Kerans, Toledo. Miss E. J. Lanten, Ashtabula; Secretary-Treasurer, Mr. Howell Wright, Cleveland; Executive Committee, the officers and Dr. W. S. Hoy, Wellston; Dr. A. C. Bachmeyer, Cincinnati; Miss Mabel Morrison, Toledo; Dr. F. C. Huth, Cambridge, and Miss M. C. Echols, Massillon.

State Conference of Charities and Correction.

The twenty-fifth annual state conference of Charities and Correction will be held in Dayton, Ohio, on November 3-5, 1915. For the first time in the history of the Conference an effort will be made to enlist the public health workers of the state by the creation of a section on Public Health. At a meeting of the executive committee of the Conference held in Dayton, June 1, 1915, it was voted to establish such a section. Robert H. Bishop, Jr., M.D.

Cleveland has been appointed chairman, and Robert G. Paterson, Ph.D., Columbus, secretary of the section. A program of three sessions will be offered which will seek to provide opportunity for hospital, public health nursing and social service workers to discuss their problems. The traveling public health exhibit of the State Board of Health will be placed in the basement of Memorial Hall where all meetings will be held.

Prevention of Blindness.

In accordance with the provisions of H. B. No. 470, entitled, "An Act for the Prevention of Blindness from Inflammation of the eyes of the New Born," the Division of Public Health Education has been working out plans in co-operation with the Ohio Commission for the Blind, for the enforcement of the law. Small booklets, each containing ten report cards, a copy of the law and the rules and regulations of the State Board of Health are to be sent to each physician, nurse, midwife and maternity institution or hospital taking maternity cases on or before October 1. These report cards are to be used in notifying the local health officers of the occurrence of cases of inflammation of the eyes of the new born. A public health nurse has been placed in charge of this work and it is the intention of the State Department of Health to supply instructive nursing service for all such cases, where such service cannot be obtained locally.

Tuberculosis Hospital Patients.

An effort to co-ordinate the work of tuberculosis hospitals and of local public health nursing services throughout the state is to be made by the Division of Tuberculosis, State Board of Health. The State Board of Health has passed rules and regulations governing such hospitals and among these is one relating to reports to the State Department of Health of all admissions and discharges of patients at each tuberculosis hospital. When an individual is admitted to a hospital, the report of such fact is made to the State Department of Health, which in turn will notify the local public health nursing service. It will be presumed that the local nurse will keep in touch with the family of the patient, watching for symptoms of the disease in other members. Upon the discharge of the patient, it will be part of the local nurse's work to keep in close touch with him to encourage the continuance of the hospital regimen.

Columbus Open-Air School.

Out of the 50 pupils who last year were enrolled in the open-air school of the Columbus Society for the Prevention and Cure of Tuberculosis, 34 have regained their health and next week will enter the public schools. Their places, however, again have been filled by other applicants and 15 more are on the waiting list.

These reports were made yesterday at a meeting of the organization. The

reports of nurses showed that there is an exceptionally large number of tubercular patients in Columbus. The six nurses took care of 962 patients during the last four months, 198 of which were new. There were 4,749 visits to patients' homes.

The work of Miss Laura McCutcheon, visiting housekeeper, has grown to such an extent that the society feels it necessary to secure an assistant. This will be done, if funds for the purpose are obtainable.

Newspaper by Tuberculous Patients.

The second issue of "The Lunger", the publication issued bimonthly by the patients of the Franklin county tuberculosis sanatorium, appeared Saturday. Edited by Leonard McKee, who has injected a degree of optimism in it which is little short of remarkable, it professes to carry on an unflinching campaign of education and helpfulness for the patients at the institution..

Originally designed for distribution to the patients only, its fame has brought many inquiries for it and as a result it now has considerable outside circulation.

The second issue contains many helpful suggestions for tubercular patients, as well as those who are fearful they may have the disease, and there are a number of breezy personals which concern patients of the sanatorium. "The Lunger" is printed by Leland Swartz on a mimeograph machine, and it is neatly bound together. The patients are now looking forward to it with considerable pleasure, not only because it concerns the institution, but because of its professional style and makeup. It carries no advertising and is paid for by the county commissioners, who are intensely interested in its welfare.

To Train Public Health Workers.

The organization at Ohio State University of a department of public health and sanitation, with a faculty composed of officers of the state board of health, is to be welcomed. It is the purpose to offer to young men and women a course of study which will fit them for public health work in Ohio and elsewhere, as health officers, members of health boards, secretaries, agents or inspectors of health organizations. There can be nothing but approval of the various efforts for the prevention of disease, both state and local. So, there can be only approval of the effort to prepare persons for active work in that interest.

It will be a happy day in Ohio, when these positions are given, not to persons who need the money, or to others who, however worthy, must learn it all in experimentation at the expense of the public health, but to those who have been scientifically trained for the service. The health of an individual or community is a prime asset, and ought to be guarded by experts.—Editorial. *Columbus Dispatch*.

Dental Clinics Opened.

The free dental clinics at the Sixth district and Washington schools were opened Wednesday, and will remain in operation until the close of the school year.—*Cincinnati Times-Star*.

CURRENT COMMENT ON MATTERS OF PUBLIC HEALTH AND SANITATION.

The Duty of Doctors.

The Ohio State Board of Health has gotten out its big stick and is after physicians who fail or refuse to report cases of contagious or dangerous diseases to the proper health authorities.

Last year, declares the State Board, Ohio physicians neglected to report approximately four thousand cases of typhoid fever. This disease is recognized as a menace. One case often leads to many others unless it is properly isolated and controlled. Reporting its presence is the first and most important step in keeping it within safe bounds.

The State Board is right. The presence of such diseases as are dangerous to the general health of the public should be reported immediately to the health authorities. Thus the latter will be enabled to prevent their spread and save many lives.

Failure to report cases of contagious or dangerous diseases will almost certainly result in other outbreaks and eventually lead to many deaths. If the reporting of such cases will save lives and the failure to report them will cause unnecessary deaths, then it follows that the one who fails to make such report is more than indirectly responsible for such deaths.

It is up to the profession which claims so high a standard of ethics and which receives such distinct protection from the state law, to see that its own members obey those laws which are designed directly for the safeguarding of the public welfare.

If the professional spirit of individual physicians cannot be trusted, there should be drastic action by the physicians as a body. Their good name in the community is at stake in this matter. — *Columbus Citizen*, 1915.

Paul Ehrlich.*

Paul Ehrlich was a genius of the first order. While he was still a student of medicine, the problems presented by the affinity of lead for certain tissues attracted his attention. From speculating on the nature of this affinity, his interest grew to include protoplasmic affinities in general, and thus was determined the direction his genius should take.

Some of the notable results of his early investigations are discoveries in bacterial staining methods, which proved of great value to Koch and which, ever since, have been in daily use everywhere; the micro-chemical differentiation of leukocytes, on which rests the study of the blood for clinical purposes; the development of the methylene blue reaction of living tissues, and the formulation of that unique conception of protoplasmic structure and function on which he based the great side-chain theory which he advanced to explain the reactions in immunity and other phenomena.

What might be termed the second phase of Ehrlich's work concerned

* Report from the *Journal* of the American Medical Association.

investigations in immunity under the guidance of the side-chain conception. No better illustration of the practical usefulness of the imagination in creating a successful working hypothesis can be given than the results achieved by Ehrlich in the field of immunity. Perhaps the usefulness is seen most clearly in the standardization of diphtheria antitoxin, which was a direct outcome of experiments devised according to the side-chain idea. Ehrlich's method, to the exclusion of others, is used all over the world; but the influence of the work carried out to test the side-chain theory of Ehrlich and his pupils still dominates investigation in all branches of immunity and the practical use of the knowledge obtained therefrom.

The side-chain theory is so well known that it is not necessary to restate it except in the most succinct form. A toxin or other antigen is without action on the animal body unless bound by molecular chains in the cells—receptors. But when so bound, the antigen causes injury to the cell, and subsequent repair, in the course of which there is an over-production of receptors, which, passing into the blood and lymph, constitute the antibody for the antigen in question, because the antigen is now bound and neutralized or destroyed before it can reach the cell. As expressed by Behring, antibodies are free cell receptors, and the elements which, when situated in the cells, are essential for the action of toxins, for instance, are also the means of healing when free in the blood. In accord with the principles of this theory, Ehrlich's vivid mind coined numerous new words, which proved helpful in the discussion of new facts and ideas, and which soon passed into current international usage.

Ehrlich's last work was the development of the experimental chemotherapy of syphilis and certain other spirochetal infections. To discuss this wonderful work fully in all its ramifications is not possible at this time. The scientific world has accepted "the development through a lengthy series of systematic bio-chemical experiments, based on original conceptions of the affinities of cellular constituents, of a successful chemotherapy of important human infections, by direct attack on the parasites by substances specially built up for that purpose and introduced from without," as the fitting culmination of the tireless activities of an altogether unique investigative spirit. As pointed out elsewhere, Ehrlich's results in experimental chemotherapy fully justify Huxley's prediction in 1881 that through discoveries in therapeutics it would become possible "to introduce into the economy a molecular mechanism which, like a cunningly contrived torpedo, shall find its way to some particular group of living elements and cause an explosion among them, leaving the rest untouched."

Paul Ehrlich will live in the history of civilization as one of the great investigators, genial, creative, fertile, excelling in "that boldness of the scientific use of the imagination which alone can extend beyond the obvious fact and reveal the unknown," one of the great benefactors of mankind.

Legal Liability of Water Company.*

DAMAGES RECOVERABLE WHEN WATER SUPPLY IS DANGEROUSLY CONTAMINATED.

The Supreme Court of the State of New Jersey has decided that a water company supplying water for domestic purposes is bound to exercise reasonable care to see that the water is wholesome and safe.

*From U. S. Public Health Reports.

In *Jones v. Mount Holly Water Co.* the plaintiff was a customer of the water company. Three of his children became ill, and he sued the company for damages, alleging that the illness was caused by contamination of the water with fecal matter. He secured a verdict for \$750 in the lower court, and the supreme court sustained the verdict.

The court held that the evidence was sufficient to justify the jury in finding that the illness of the children resulted from the contamination of the water and that the company had been guilty of negligence in supplying water which was unsafe for drinking purposes.

Judge Kalisch, in the opinion, said:

It must be borne in mind that the defendant company was in the water-supply business for profit. The plaintiff had paid for the supply which he was to receive, in advance. Hence it became the duty of the defendant company to give to the plaintiff water fit for domestic purposes, including fitness for drinking. Water is a necessity of life, and one who undertakes to trade in it and supply customers stands in no different position to those with whom he deals than does a dealer in foodstuffs. He is bound to use reasonable care that whatever is supplied for food or drink shall be ordinarily and reasonably pure and wholesome.

* * * * *

Actual notice or knowledge of the unwholesomeness of the water was not an essential element to be proven in order to establish the defendant's liability. It was sufficient if there was testimony tending to show that the defendant, in the exercise of reasonable care, might have discovered the unwholesomeness and dangerous condition of the water.

Reasons for Requiring Morbidity Reports.

From the Report of the Standing Committee on Morbidity Statistics of the American Public Health Association.

The reasons for requiring reports of cases of the controllable diseases are:

1. That the interest of the patient may be protected and that he may receive suitable and proper care and treatment.
2. That the disease may be prevented from spreading from the patient to other members of the community.
3. That the factors or conditions that produced the disease in the patient may be removed, or so modified that they will not do similar injury to other members of the community.
4. That, by recording facts in regard to the time, place, and conditions of occurrence of cases of diseases, knowledge of their causes or means of spread hitherto unknown may be obtained which will be of value in the control of these diseases.
5. That, by having a means of promptly learning of the occurrence of disease, the community may have a current indicator of the status of the community as relates to disease and of the efficiency of its sanitary work.
6. That the compiled, classified, and analyzed records in the form of morbidity statistics may give the community a record of the relative prevalence of disease from year to year and under varying conditions, and show the effect of public health measures and of sanitary work.

Report of the Standing Committee on Morbidity Statistics.

At the Jacksonville meeting of The American Public Health Association the Standing Committee on morbidity statistics made its first report, which in view of the recent progress along this line made by our own state, is of peculiar interest to Ohio public health workers.

As morbidity statistics are necessarily based on recorded cases of disease, the committee discusses first the nature of morbidity reports. The reasons for requiring these reports as given by the committee are quoted in full elsewhere. (Page —).

The use of case reports for the protection of the patient is becoming more and more common; for example eye nurses investigate reports of ophthalmia neonatorum, and antitoxin is often furnished free to those who could not otherwise obtain it. It is only through complete reports that health departments are able to protect the community against the spread of infectious diseases. The spread of any disease can be checked if all cases are promptly reported to an efficient health authority. The accumulated records are of great value in revealing epidemiological facts regarding disease and in determining the causes of disease. These morbidity reports accumulated, classified, compiled and analyzed constitute morbidity statistics, upon which the future, not only of public health and preventive medicine, but of the practice of medicine itself largely depends.

Cases should be reported to the health department as this is the only agency which has the necessary authority and equipment to utilize the reports. Reports should be made by physicians, as they are most likely to come in contact with notifiable diseases and to recognize them. Cases should be reported as soon as recognized and for many diseases as soon as suspected.

The nature of the data to be given and the form of report recommended by the committee are essentially the same as embodied in the physician's notification blanks now in use in Ohio. For some diseases other information would be of value, but it is hardly practicable to make the report blank more complicated.

The statistical treatment of morbidity reports should be, first to provide the local health authorities with first hand information to enable them to properly control and check an outbreak of the disease. The second purpose is to put the morbidity experience in such a form that it may be readily compared by time, that is, by days, weeks, months, and years, and by the geographical distribution. The factors of sex, age, and race are particularly important, as it may thus be determined which classes of persons are more susceptible to the different diseases. By the study of morbidity statistics we may determine the relative values of different methods applicable to the specific infectious diseases.

Within the past five years fifteen states have provided for the reporting of occupational diseases, and five states require a monthly medical examination of employees in especially unhealthful employments. Nearly one-half of the total manufacturing population of the United States is now working under the standard schedule for accident reports adopted by the American Association for Labor Legislation in 1911. Such reports enable public health workers to locate the danger spots and disease foci of industry, and such knowledge will eventually lead to a better safe-guarding of the life and health of the working population. *Abstracted Am. Jour. Pub. Health, 1915.*

Administration of the Toronto Department of Public Health.

DIVISION OF PUBLIC HEALTH NURSES.

The Division of Public Health Nurses constitutes the vital connection between the Department of Health and the homes of the city. The health nurses are at once the home scouts, the ambulance corps, and the guide-philosopher-friend squad of the city's army of health promotion and disease and death prevention, known as the Toronto Department of Health.

The work of the division is distributed under three main functions:

1. The tuberculosis division issues city orders for admission to the Hospitals and Sanatoria, and sends children who have been exposed to tuberculosis to the Preventoria. Physicians notify the division of all cases of tuberculosis, specifying such cases as need visits from the health nurses. A quite unusual feature is that the majority of cases visited by the health nurses are under the care of private physicians. The Sanatoria send a daily report of admissions and discharges to the Division of Health Nurses. The nurses co-operate with the Division of Communicable Diseases in securing fumigation when necessary, give home instructions in nursing, assist with bedside nursing in emergency, distribute sanitary supplies, refer cases to hospitals, and secure the attention of social agencies. A leading Toronto medical authority on tuberculosis states: "No real advance was made in the handling of tuberculosis until the city Health Department secured the registration of tuberculosis cases. Since that time, rapid progress has been made through the policy of co-operation pursued by the Health Department." Full credit for the success of follow-up work should be given to the Division of Health Nurses, the Division of Child Hygiene, and the Division of Public Service.

2. Under the head of Child Welfare, the health nurses conduct work in connection with well-baby clinics, mothercraft classes and prenatal instruction, and co-operate actively with the Hospital for Sick Children. The health nurses are the field agents of the Divisions of Public Service and Child Hygiene, making careful investigation under the direction of the former, and taking charge of the nursing end of the well-baby clinics for which the Child Hygiene Division is co-operatively responsible.

The health nurse who attends the daily medical clinic at the Hospital for Sick Children transmits all orders of the hospital doctors to the district nurses. The district nurses visit the homes concerned and give the necessary help and instructions to insure that the orders are intelligently and carefully carried out. Babies in medical wards are reported to the Health Department on admission and discharge in order that they may be visited promptly by health nurses.

As a matter of co-operation, the Obstetrical departments of the various hospitals report the discharge of all babies to the Health Department, so that each mother and baby can be reached by the public health nurses.

Prenatal cases discovered in the general health visiting are recorded at once and the nurses see that medical and nursing care is provided.

An investment in the conservation of human life through educational work with mothers, and preventive work with children, will bring as large a return to the city as any investment could. The saving of a child for efficient living is more important than the saving of an adult life for a few years of perhaps inefficient living. The true road of economy in hospital, police, prison and

reformatory administration lies through increased efficiency in and, when necessary, appropriations for child welfare and tuberculosis work.

3. The health nurses co-operate with other city departments, visiting the employes of the Street Cleaning Department and the Police Department. The Bureau of Municipal Research is satisfied that the health patrol of the Health Department is doing exceedingly efficient work, that its adoption of the co-operative principle is enabling the city to obtain many times the service it could possibly obtain by the expenditure of the same money on absolutely independent work, and that any changes necessary in internal routine can easily be made by the division itself in consultation with the departmental statistician who is well versed in the devising of keys and forms.

Social work is fundamental to the work of the Department of Public Health. Preventive medicine to be effective must start at the beginning. The beginning is in the home where the department can reach the coming wage earners and the mothers, grandmothers, and remote ancestors of coming generations. Increased expenditure on social service will mean decreased expenditure on jails, hospitals, asylums, fire departments, and the various other negative sides of community life. — Abs., *The Public Health Journal*, Canada, 1915.

A Department of Public Health.

Departments of Public Health, in so far as they are efficiently administered, are an investment, not an expense. The saving of an infant human being for a life of productiveness means, at an average valuation, a saving for the community of from \$2,000 to \$5,000. The lengthening of the productive life of an adult by one year means an addition to the general stock of wealth of the difference between his production and consumption. The salvation of one individual from a life of miserable dependence upon society, caused by insufficient or improper nourishment, by absence of nursing care during illness, by inadequate medical treatment, by impure air, water or food, for a life of productive usefulness changes a large liability into an equally large asset.

The function of a Board of Health has changed progressively from the cure of contagion to prevention of contagion, to the prevention of death by disease of any sort, and in this age to the promotion of community efficiency through health measures. The conception has changed from a narrowly negative one to a progressively expanding positive one.

An increase in effective expenditure on public education and public health will result, in time, in a steady decrease of expenditure on orphans' homes, hospitals, sanitariums, jails, penitentiaries, courts of justice, which make up so large a part of the purely negative side of city administration and which are at best palliatives or necessary evils. — Abs. *The Public Health Journal*, Canada, 1915.

Publicity in Legislation.

The most valuable reformatory force is publicity. Those who are actuated by unworthy or selfish motives object to having their acts made public. One of the evils connected with legislation has been the ignorance on the part of

the voter, as to the position of his representative on important measures. The public has a notoriously short memory, and often the politician has been able by smooth phrases and glib generalities to explain away his record. In one state at least, however, members of the state legislature will have to stand on their record, at least so far as public health bills are concerned. In a recent issue of the Ohio State Medical Journal appears a tabulation of the vote of all members of the state legislature on six important public health measures before that body during its last session. A glance shows how any member stood on any particular measure. As the facts tabulated are taken from the official record of the house and senate, they cannot be disputed, while the right of the voter to know how his representative has stood on any measure is beyond question. The more the people know about their representatives, the better the chances of good government. — *Abs. J. A. M. A.*, 1915.

The Use of Asphyxiating Gases.

The gas appears to be evolved in some special apparatus from a tube projecting towards the opposing trenches when the wind is blowing in that direction. It appears in the form of a yellowish-brown smoke which floats slowly along close to the ground and is easily visible from a considerable distance. The gas is chlorine, a body two and a half times heavier than air. (Dr. Haldane states that the gases may be chlorine or bromine). Buttons turn green and bayonets black. It rapidly causes choking unless diluted, when it causes smarting of the eyes and violent coughing. In a shell which had been dug out of the ground after it had lain for a number of days, the odor closely resembled that of a hyacinth. The odor caused workers to turn giddy and sick. A respirator drill has been instituted and is a feature of daily life.

Three groups of cases can be made from the severity of the symptoms: Group 1.—(Mild). The symptoms are a severe dry bronchitis which disappears rapidly with the exception of some increased frequency of respiration which persists for days. Group 2.—(Moderately severe). Patients are actually ill, are cyanotic, panting with greatest discomfort and pain, headache, fever to 100 degrees for three or four days. Patients are usually drowsy and tend to get worse at night. Physical signs are of bronchitis and bronchiolitis. Group 3.—(Very severe). Death within 24 hours or so, preceded by unconsciousness and signs of asphyxiation from acute pulmonary oedema. The blood is intensely dark and clots readily. Oxygen gives no benefit. Patients unable to expectorate the frothy secretions.

The post-mortems show general pulmonary oedema. Blood smears show many myelocytes and an increase of the lymphocytes. The red cells are unaltered.

Respirators soaked in sodium bicarbonate are recommended. They consist of oblong pads of bleached absorbent cotton-wool gauze and fitted with a band to go round the head. Cotton waste with a solution of sodium bicarbonate and sodium hyposulphite in the proportion of three parts to one is recommended. The hyposulphite frees the chlorine, which becomes HCl and is neutralized by the alkali present. The Paris Academy of Medicine has recommended as a preventive a solution containing glycerine. The proportions

stated are: Sodium hyposulphite, 1,000; Sodium carbonate, 200; Glycerine, 150; and water, 800. The glycerine tends to prevent the respirators from becoming dry during use. It is necessary to wash and recharge the fabric after use. When the gas is recently breathed, inhalation of alcohol are recommended alternating with ammonia, but there is little hope for persons suffering from after-effects. — Abst. *British Medical Journal*, 1915.

Qualifications for Health Officers in New York State.

The New York State Public Health Council has adopted regulations requiring special qualifications of all health officers appointed after November 1, 1916. This regulation provides that candidates shall be graduates in medicine of not less than three years standing; that they shall not be less than twenty-four nor more than sixty-five years of age; and that they shall have had a training in public health work gained by:

a. A correspondence course in public health of one year's duration with at least one week of practical demonstrations in laboratory and field work, the whole to be approved by the Public Health Council.

b. A public health course of at least six weeks with practical laboratory and field work at an approved educational institution.

c. In place of either of the above, candidates shall submit evidence satisfactory to the Public Health Council of special experience or training in public health work, with examination if required by Council.

The regulation provides further that any of its provisions may be waived in special cases. — Abst. *Am. Jour. of Public Health*, 1915.

A New Book on the House-Fly.

A new book on the house-fly, the importance of which lies in its completeness, is "The House-Fly, *Musca Domestica* Linn.: Its Structure, Habits, Development, Relation to Disease, and Control," by C. Gordon Hewitt.*

While all of the fourteen species of flies that frequent houses, are given attention in this work, most of the book is devoted to the *Musca domestica*. The proportion of *M. domestica* to other species has been found to be from 87.5 to 98.8 per cent.

The book is divided into six parts. The first part gives a description of the *M. domestica*, and a detailed account of the anatomy of the adults together with the distribution of this species and its habits in regard to food, temperature, and the like. The second part takes up the breeding habits, life-history, and the anatomy of the larva of the *M. domestica*. The enemies of the house-fly and its parasites are described in the third part, while the other species that frequent houses are treated briefly in part four.

Of especial interest to sanitarians are parts five and six. The first of these treats of the dissemination of pathogenic organisms by flies, — one of the six chapters in this part being devoted to typhoid fever and another to the

* Cambridge: The University Press, 1914. 15 + 382 pp., 104 ill., 8 vo. G. P. Putnam's Sons, New York.

summer diarrhea of infants. Part six deals with the means of preventing the breeding and spread of flies, and with organized efforts to control them.

Some criticism has been made of the arrangement of the anatomical part of the book, in that the chapters dealing with the anatomy of the adult and of the larva might better be brought together. Some of the anatomical descriptions also are hard to follow and are unintelligible for any one not an entomologist.

One of the interesting and instructive chapters is the one on the feeding habits of the house-fly, including, as it does, some valuable, if unpleasant, original observations by the author on the nature of fly specks.

The part of the book which treats of the enemies and parasites of the fly seems to be full and adequate, dealing with the habits and life-histories as well as the adult structure of these useful organisms. The fungus, *Eupusa muscae*, seems to be the most important of the checks on the increase of the fly.

Part five, comprising about a third of the book, sets forth in detail the evidence against flies as carriers of the germs of disease and gives a useful summary of the extensive literature on the subject. In this connection, however, it should not be forgotten that flies in themselves are not dangerous. They become so only when allowed access to excretions that contain pathogenic organisms. The first problem of sanitation, therefore, is the control of dangerous excretions. The control of the fly is secondary.

Mechanically, the book is pleasing. The colored plates deserve especial mention. While not intended as a popular treatise, the book deserves wide circulation and should be read by all who are interested in municipal or rural sanitation. — Abs. *American Journal of Public Health*, 1915.

Life Tables of Eighteen Towns of Scotland.

Dr. James C. Dunlop, Superintendent of the statistical department in the office of the Registrar General for Scotland has prepared life tables of the towns in Scotland having a population in 1911 of over 30,000. In introducing his discussion of these tables Dr. Dunlop states his belief that life tables furnish the best means of comparing the health conditions of communities. This would undoubtedly be true if the numbers dealt with were sufficiently large. Unfortunately, however, there are only four of the eighteen Scottish towns whose population is large enough to make such tables of great value. In a city of less than 100,000 the probable error in each separate calculation would be so large as to make comparisons decidedly unsafe.

The collective life tables of these towns show that the expectation of life at the time of birth of male children is 46.33 years and of female children 50.14 years. The figures for Scotland in its entirety are 50.14 for males and 53.13 for females, and for the part of Scotland exclusive of these towns 53.68 for males and 55.80 for females. A deficit in life expectancy of from 4.3 percent to 18.2 percent is found at all ages and both sexes in comparing the towns with the rural districts of Scotland. As compared with published life tables of other countries, however, the showing of the Scottish towns is fairly good.

In Glasgow, the only great metropolitan city of Scotland, the expectation of life among male children at birth was found to be 43.8 and among female

children 47.8. These figures are decidedly less than the average and the only town of Scotland with lower figures is Govan, a suburb of Glasgow, since incorporated with the larger city. Edinburg, the capital city, shows a male expectancy at birth of 49.8 and a female expectancy of 54.3 giving a difference of 6.0 years for males and 6.5 years for females in favor of the old residential city as compared with the new industrial city. The figures for Aberdeen and Dundee, both seaport towns, are generally lower than for Edinburgh but higher than for Glasgow.

The figures for the smaller towns are discussed in detail in the original article, but no information is given as to the nature of the population of these towns.—Abs. *The Journal of State Medicine*, 1915.

Human Plague.

After a lapse of nearly a year a case of human plague occurred in the city of New Orleans on the 27th of August. This case was confirmed as true bubonic plague on September 8th. The epidemiological investigations as to the exact source of the infection have not yet been completed but it is believed that it was probably received in the city of New Orleans. Up to date over 91,000 buildings in that city have been rat-proofed and over 435,000 rodents have been captured in traps alone. The occurrence of this case demonstrates the difficulties surrounding the eradication of the disease and indicates that had it not been for the active co-operative efforts of the United States Public Health Service and of the Departments of Health of the State of Louisiana and the city of New Orleans, the outbreak would have reached greater proportions and would have been longer continued. It also points out to other cities the necessity for ridding themselves of the rodent carriers of the disease and of thoroughly rat-proofing all of their buildings. No fear is felt that this case will be followed by an outbreak. Officers and men of the Public Health Service, well trained in the control of the disease, are on the ground and with the health authorities of the city of New Orleans are taking every precaution to prevent the spread of the disease from the city and within it.

The Public Health as Affected by Chronic Diseases of the Heart, Kidney, and Arteries.

Dr. Horace Greeley of Brooklyn, N. Y., calls attention to the need of giving more attention to degenerative diseases in the course of public health work. Lesions of the heart, arteries and kidneys are found at all ages, and are the cause of a constantly increasing morbidity and mortality. These diseases are to a large extent preventable. Acute articular rheumatism is responsible for a very large part of organic heart disease. Any agency which causes continuous over-exertion of the heart will cause degenerative changes in that organ, either through exhaustion or by direct toxic action upon the muscles or nerve cells. The heart is affected by the obstructive influence of diseases of other organs, but especially by systematic arterio-sclerosis or a constantly restricted arterial system resulting from the prolonged irritant action of alcohol, nicotine or lead, from the perverted metabolism of gout.

from the retained waste of chronic nephritis, and from the overloading of the blood with the products of digestion and intestinal putrefaction. Other specific causes of heart disease are syphilis and the excessive use of coal tar drugs. An etiological classification of 600 hospital cases of heart disease by Dr. Cabot gave the following results: Rheumatic 278, syphilitic 74, arterio-sclerotic 93, nephritic 117, goitre heart 8, doubtful 30. Degenerative diseases are particularly likely to affect the modern business and professional man, as the nervous tension of his work, probably acting through gland secretions whips up the circulatory system to work beyond its limit. It is also frequently the case that the nervous tension calls for stimulants such as tobacco, alcohol and drugs which further increase the heart strain. A life of nerve tension with but a small amount of physical exercise also leads to imperfect assimilation of food and the overloading of the system with materials which act as irritants.

The physical examinations of school children in New York reveal cardiac lesions in from one-half of one per cent to two per cent, varying with age and economic condition. The figures of the Life Extension Institute from the examination of 2,000 employees of commercial houses, banks, etc., in New York City showed 5.38 per cent with organic heart disease, 13.1 per cent with arterio-sclerosis, 35.63 per cent with urinary symptoms and 12.77 per cent with combined disturbance of circulation and kidneys. From 10 to 25 per cent of all applicants for life insurance are rejected and of these from 43 to 69 per cent were declined on account of circulatory disease.

Mortality statistics are deceptive in connection with these diseases on account of improper diagnosis and improper classification, but it is nevertheless certain that the death rates from diseases of the heart, arteries, and kidneys have increased rapidly in the past fifty years. This is in marked contrast with the falling death rate from tuberculosis, typhoid fever, and other communicable diseases.

The first consideration in the way of prevention is to do everything possible to remove the predisposing cause. General hygiene extending to infancy, and beyond to eugenics must be the main reliance. The restriction and elimination if possible, of scarlet fever, syphilis, and rheumatism, is particularly important. All measures tending to prevent poisoning from lead, mercury, and arsenic, and to prevent the excessive use of alcohol, coffee, drugs, and tobacco tend to reduce morbidity from circulatory and renal diseases. It must constantly be emphasized that the prevention of these degenerative diseases lies in the intelligent regulation of work, diet, rests, and exercise, the avoidance of intemperance, excesses of all kinds, and the prevention of infectious diseases. Instruction on all of these points by public health workers is practicable. Talks to school children, public lectures, leaflets and pamphlets, billboard posters, exhibits and moving pictures are among the means of public education suggested.—Abs. *Am. Journal of Public Health*, 1915.

Midwives and Early Infant Mortality.

The health officer of Jacksonville, Florida, Dr. C. C. Terry, has compiled figures showing that the mortality among infants in his city whose births were attended by midwives, is nearly three times as great as among infants

whose births were attended by physicians. In the five years 1909-1914 inclusive, 51.6% of the births were attended by midwives, usually ignorant negro women, and of the 190 deaths under the age of one month, 140 were of children who had been ushered into the world by negro "grannies." A large proportion of these deaths were caused by tetanus neonatorum. The negro midwives are governed by superstitions distinctly traceable to Africa and many of their customs are disgustingly filthy. During the past two years a number of the worst of these women have been removed from practice, and sterile umbilical dressings furnished by the health department have been used by the remainder. These measures have already resulted in a marked reduction in the mortality during the "tetanus period." — Abs., *Am. Journal of Public Health*, 1915.

Cleaner, Cheaper Foods.

Illustrations in the August 14 number of "The Survey" show three of many activities undertaken in the first two years of its existence by the Social Welfare Department of the New York Association for Improving the Condition of the Poor, with a view to "fostering preventive and constructive social measures."

The Food Supply Store, run by the department, is a model of cleanliness and efficiency. It serves both as a food distribution agency for families under the care of the association and also does a retail cash business. Its average daily sales amount to nearly \$100. According to the Department of Social Welfare, in the ordinary retail store, 37 cents out of every dollar is spent for retail distribution and profit and only 63 cents for food. In the Food Supply Store, 17 cents out of every dollar is spent for administration and distribution and 83 cents for food.

Another illustration shows the People's Kitchen at Twenty-seventh Street and Tenth Avenue. The housewife in the neighborhood of the kitchen can obtain a large variety of hot, well-cooked foods at from two to seven cents a portion. Most of the food is taken out to be eaten in homes or nearby factories. Three meals a day are served in the kitchen, however, to the longshoremen, school children, factory workers, and mothers in the vicinity.

For two cents additional charge, hot food is delivered to sick or convalescents. On a recent inspection of the kitchen by the Bureau of Food Inspection of the Department of Health, it was given a perfect sanitary score.

The third illustration is that of a peddler's push-cart, the top of which is covered by glass doors, thus protecting the food from fingers, filth, and flies.

Early Diagnosis of Pulmonary Tuberculosis in Adults and in Children.*

DIAGNOSIS IN ADULTS.

Do's.

REMEMBER the following points:—

1. Take a careful history of your patient. Ask definite questions in a logical and regular sequence. Every patient should be asked whether during

* *Public Health Bulletin, Mass. State Dept. of Health*, 1915.

the years from fifteen to twenty-one he considered himself, or was considered by his parents, as of the strong and robust type, the thin and wiry type or of the delicate type. It is important to ask not, "When did you first feel sick?" but rather, "When did you last feel perfectly well?"

2. Remember the paramount importance of constitutional signs and symptoms.

In most cases, except for a cough, which is usually present, the constitutional signs and symptoms are far more striking than local symptoms.

3. Remember that loss of weight must be satisfactorily explained.

Every patient should be asked, first, "What is your maximum weight?" second, "Your present weight?" third, "What do you consider good average weight in health?" fourth, if the patient has lost weight, "Over how long a period has this loss taken place, and how do you account for it?"

4. Inquire concerning loss of strength and energy.

5. Do not forget the importance of undue fatigue and ease of tire.

6. Continual or occasional evening fever must be explained.

The thermometer is not used anyway nearly as much as it should be. In the absence of other definite causes, if a patient is found to be running an afternoon or evening fever of 99 or over, a tentative diagnosis of some such infection or toxemia as tuberculosis is justifiable.

7. Remember the importance of a subnormal temperature accompanied by a high pulse.

This combination is an important one and is often caused by tuberculosis.

8. Remember that a hemorrhage is evidence of pulmonary tuberculosis until the contrary is proved.

Failure to observe this rule is causing many tragedies and unnecessary deaths.

9. Bear in mind that pulmonary syphilis is not so uncommon as it is supposed to be.

10. Remember that early cases of exophthalmic goitre may simulate early pulmonary tuberculosis in every way.

11. Depend more on your thermometer, your history and constitutional signs and symptoms than you do on percussion and auscultation.

12. Remember to use your common sense.

Bear in mind that it is a human being and not merely a pair of lungs that you are dealing with.

Don'ts.

Do not forget the following:—

1. Don't be in too much of a hurry.

2. Don't forget to strip the patient to the waist.

3. Do not expect to find marked signs in the lungs in every case.

4. Do not wait for a positive sputum.

Absence of proof is not proof of absence.

5. Don't forget that practically all pleurisies, wet or dry, of idiopathic origin, are tuberculous.

6. Don't forget to look elsewhere than the lungs.

Make your routine physical examination as thorough as possible.

7. Don't base your diagnosis on X-ray evidence alone.

The X-ray is a valuable adjunct to our means of physical examination; it should never take the place of our older, well-known methods.

8. In adults do not place any value on the skin tuberculin test, whether positive or negative.

9. Don't forget that chronic bronchitis, influenza, bronchiectasis, emphysema, asthma and other chronic and subacute lung conditions still exist and will continue to exist, and that they often resemble pulmonary tuberculosis.

10. Don't forget that the reverse of the above is also true.

11. Don't forget that people may be run down, tired, weak, etc., without having consumption.

DIAGNOSIS IN CHILDREN.

Do's.

Remember the following points:—

1. Remember the difference between tuberculosis infection and tuberculosis disease.

2. Remember the frequency of tuberculous infection.

3. Remember that in children tuberculosis is primarily a disease of the glandular system.

Whereas in infancy tuberculosis takes the form of a general septicaemia, and is rapidly fatal, in the years of childhood it primarily affects the glandular system all over the body. It is only when this first line of defence is broken through that the lungs or other organs are affected.

4. Remember the importance of exposure, and that bovine as well as human sources are of importance.

This is particularly important in the case of children. Tuberculosis in children is often due to tuberculous milk.

5. Remember that in children by the time the lungs themselves are involved the disease is far advanced.

In these real early cases one rarely finds signs at the apices. It is by means of a positive cutaneous tuberculin test, the X-ray, perhaps slight inter-scapular dullness, sometimes enlarged veins on the chest, frequently a positive d'Espine's sign, combined with constitutional signs and symptoms, on which the diagnosis is based.

6. Remember the importance of constitutional signs and symptoms.

The principal constitutional signs and symptoms are ease of tire, the loss of weight or failure to gain weight, pallor, malnutrition and debility.

7. Remember that while in adults there is no cough characteristic of tuberculosis, in children there may be present a cough which is more or less characteristic of bronchial gland enlargement. These bronchial glands are situated at the root of the lungs, and if they attain sufficient size may press on the trachea, the large bronchi or on nerves, and thereby cause a paroxysmal, strident, brassy cough, usually without sputum, often closely resembling whooping cough.

8. Remember that a positive skin tuberculin reaction is of infinitely greater importance in children than in adults, but that its value becomes less and less with increased age.

9. Remember that the X-ray in children may show enlarged bronchial glands, but that it does not prove these glands to be necessarily tuberculous.

DONT's.

Don't forget the following points:—

1. Don't fail to realize the responsibility you are taking in stamping a child as tuberculous.

2. Do not forget in cases of doubt that it is possible, and far better, to institute proper treatment without casting the stigma of tuberculosis.

3. Don't make up your mind beforehand as to what you are going to find.

4. Don't forget that while a positive d'Espine sign is good evidence of enlarged mediastinal glands, it does not prove that they are tuberculous.

A positive d'Espine, or, in other words, bronchial whispered voice sounds, heard below the level of the fourth dorsal vertebra, is good evidence that the mediastinal glands are enlarged. It is not safe, however, from this sign alone to draw any further conclusions.

5. Do not expect to find marked signs in the lungs in every case of bronchial gland enlargement.

A type case is characteristic. Substernal dullness, interscapular dullness, enlarged veins on the chest, glands in the neck and paroxysmal, brassy cough make evident the underlying condition. In most instances, however, the diagnosis must be based on far less than this.

6. Don't forget that processes due to influenza, the pneumococcus and other organisms are common in children, and are often mistaken for tuberculosis.

Little patches of consolidation, due to either influenza or the pneumococcus, may simulate in every way one due to tuberculosis. While the treatment is approximately the same, the prognosis is, of course, very different.

7. Don't forget that improper feeding, diseased tonsils and increased adenoid tissue, a chronic middle ear and other conditions, may simulate tuberculosis.

8. Don't forget that your diagnosis rests, not on one or two striking signs and symptoms, but on an accumulated mass of single details.

Do not forget to be frank and open with the parents, and to explain to them the exact situation.

Mixed Vaccines.

The use of serums and vaccines in treating disease is more common than ever before. There has been a great increase in the amount of these products produced and an increase in the number of firms producing them. There is a tendency on the part of the manufacturers to mix these products just as the drugs in a shot gun prescription are mixed, no doubt thinking that if one vaccine does not produce results, the other may. The layman does not use vaccines and does not purchase them, but it is the physician who is responsible for their use. The layman buys mixed drugs and the physician buys and administers mixed vaccines.

The manufacturers claim that many infections are due to the action of two organisms and for this reason a mixed vaccine is indicated. Considering the etiology of most infections for which vaccines are administered it is found one organism is responsible for the pathogenic conditions found. For example, the diphtheria bacillus is the sole cause of diphtheria; the tetanus bacillus,

of tetanus; and the typhoid bacillus, of typhoid fever. The fact that other organisms may be found in the infected region does not indicate that they aid in producing the infection.

It occasionally happens that two or more organisms act together, sometimes accidentally, in producing infections, but such cases do not justify the manufacturer of mixed stock vaccines. Only when the association of organisms has been demonstrated bacteriologically, is a mixed vaccine indicated. Even then the vaccines could and perhaps should be prepared separately and administered separately, according to indications, or be mixed before injection. The organisms in mixed stock vaccines "often are common saprophytic residents" of the mucous passages from which the culture is taken.

The following mixture of vaccines is recommended for common colds and catarrhal conditions of the respiratory passages: *Bacillus influenzae*, *staphylococcus aureus*, *staphylococcus albus*, *streptococcus*, *pneumococcus*, and *micrococcus catarrhalis* (group). For pyorrhea practically the same combination, with the addition of diphtheria, is recommended. Mixed vaccines are also freely recommended for the treatment of gonorrhea and its complications. The use of mixed vaccines is not only contraindicated, but the injection of numerous bacteria and their toxic products may produce harmful results. It is a grave mistake to expect a mixed vaccine to cure a number of diseases each with different cause, as in hay fever and similar conditions.

To discourage the production of the shot gun vaccine and the sale of ready-made mixtures, physicians should make a careful diagnosis of each case and employ a vaccine prepared for the organism found. Unscrupulous manufacturers and the literature which they supply are not always dependable and physicians should not be influenced by their advertising.—*Abs. J. A. M. A.*, 1915.

The Significance of Typhoid Carriers in Community Life, With a Practical Method of Detecting Them.

The Widal reaction has a valuable place in detecting typhoid carriers. Bigelow in 1911 reported its value in tracing the source of an epidemic of 213 cases. The carrier in this case had had typhoid fever twenty-six years previously. Two weeks before the outbreak of typhoid fever on his milk route he had had a mild attack of diarrhea. *B. typhosus* was isolated from the urine. In 1912 Bigelow reported a second successful attempt to locate the source of infection by means of the Widal reaction. These results were confirmed by one of the writers in investigating the source of a number of typhoid cases among the members of a crew of sixty. *B. typhosus* was isolated from the feces in this case also. During 1914 this method was utilized by the Minnesota State Board of Health, and five interesting results are recorded. In the first outbreak, a woman who had suffered from typhoid fever in 1898, and who had suffered from rheumatism, chronic appendicitis, "liver trouble," and gall stones ever since, was found to be a carrier. The victim in this case was a trained nurse, and used more care than might ordinarily be expected, so only a few cases were traceable to her. In the second instance a woman who had had typhoid fever in 1909 was found to be a carrier by means of the Widal reaction. Fifteen cases of typhoid fever had occurred among those in her immediate surroundings. In the other three instances recorded, the Widal

reaction was the means of detecting the carrier and in all cases *B. typhosus* was recovered from the feces or urine.

The authors summarize the typhoid histories of fifty-four possible carriers. Of thirty-seven whose blood gave typical Widal reactions, seven gave a history of typhoid fever; three gave a history of gastro-intestinal symptoms and three of continued fever. No history was obtainable from the remainder. Of seventeen who gave atypical Widal reactions, four gave a history of typhoid fever; three of gastro-intestinal symptoms and two of continued fever.

In an institution for the feeble-minded and epileptic with a population of about seventeen hundred, an outbreak of typhoid fever in 1914 led to an investigation showing that the disease had been endemic for years. Specimens of blood were obtained from 1,548 persons and the Widal reaction was positive in twenty cases. Six of these persons have been proven to be typhoid carriers and *B. paratyphosus* was found in one.

Observers abroad and at home agree in general that the blood of typhoid bacillus carriers, gives the agglutination reaction. A majority of those who have studied this problem also agree that nearly all those whose blood gives the Widal reaction are carriers. In this connection must be mentioned the fact that typhoid carriers are frequently overlooked when resort is had only to bacteriological examination of the stools and urine.

The present paper is meant to direct attention to the value of the Widal reaction as a preliminary step in locating carriers. It should also be used in excluding certain persons from positions where contamination of the milk and food supply is easy. The test might be placed on the score cards of dairies, and persons who wish to serve in the kitchen or dairies of public institutions should be subjected to this test as a routine measure. Although Conradi states that one-fifth of the carriers would escape if this test were used, the value of the reaction is still manifest. It should be used, not alone, but in conjunction with bacteriological analyses of feces and urine for the specific bacillus.—*Abs. Am. Jour. of Pub. Health*, 1915.

The History of a Typhoid Carrier.

This carrier was treated with autogenous vaccines and his feces gave negative results for the *B. typhosus* for four months succeeding this treatment. When released from quarantine on account of the negative results, he infected three persons. In a further attempt to cure this carrier the gall bladder and its duct were removed by surgical intervention. Nevertheless typhoid bacilli were found in the feces several times after the operation. The gall bladder was normal and its contents were free from typhoid organisms. An interesting point in connection with this carrier is that after forty-one successive examinations of feces during a period of fourteen months, all with negative results, the typhoid bacillus was isolated from stomach contents containing bile.

In all thirty persons were infected by this carrier, including five who died. The dangerous character of this carrier and the stubborn nature of his infection are points of interest in this case.—*Abs., Jour. A. M. A.*, 1915.

Pasteur Treatment for Rabies.

During 1913, 330 persons submitted themselves for antirabic treatment at the Pasteur Institute (France). No deaths resulted. Since the establishment of the institute the number of those taking the treatment has gradually decreased. In 1886, 2671 persons were vaccinated and 25 died, a mortality of 0.94 per 100 persons. In 1896, 2308 persons were treated and 4 died, a mortality of 0.30 per 100 persons. During 1912 and 1913, 395 and 330 persons were treated, respectively, and no deaths occurred. The mortality has decreased each year.

The persons treated at the institute are divided into three classes:

- a. The animals which bit this class of persons were proved to have rabies by animal inoculations or by the deaths of the other animals bitten.
- b. The animals which bit this class of persons were proved to have rabies by veterinary examination.
- c. The animals which bit this class were suspected of having rabies.

The cases are also subdivided according to the anatomical situation of the bite.

Year 1913	Head Bites			Hand Bites			Arm and Leg Bites			Total		
	Treated	Dead	Mortality	Treated	Dead	Mortality	Treated	Dead	Mortality	Treated	Dead	Mortality
A	20	0	0	43	0	0	10	0	0	73	0	0
B	16	0	0	67	0	0	30	0	0	113	0	0
C	19	0	0	84	0	0	41	0	0	144	0	0
Total	55	0	0	194	0	0	81	0	0	330	0	0

No statement can be made from this table as to the effect of the anatomical situation of the bite on the mortality as there were no deaths. A large majority of the cases were French but a few came from other parts of Europe and some from the French colonial possessions.—Abs., *Annales de l'Institut Pasteur*, 1915.

REPORT OF THE HYGIENIC LABORATORIES OF THE OHIO STATE BOARD OF HEALTH, FOR THE MONTH ENDING AUGUST 31, 1915.

Diphtheria: Positive 65; Negative 118; Suspicious 23.....	206
Tuberculosis: Positive 84; Negative 172.....	256
Typhoid: Positive 23; Negative 71; Suspicious 23.....	117
Rabies: Positive 10; Negative 5; Unsatisfactory 1.....	16
Malaria: Unsatisfactory	1
Chemical Examinations of Water.....	51
Bacteriological Examinations of Water.....	266
Foods	2
Fertilizers	2
Miscellaneous	6
Total number of examinations.....	923

REPORTED CASES OF NOTIFIABLE COMMUNICABLE DISEASES, AUGUST, 1915.

	<i>Cities</i>	<i>Townships and Villages</i>	<i>Total</i>
Tuberculosis (all forms)	429	80	509
Pneumonia	52	13	65
Typhoid Fever	350	231	581
Diphtheria	327	110	437
Whooping Cough	507	281	788
Measles	188	75	263
Scarlet Fever	133	66	199
Chickenpox	64	23	87
Smallpox	41	50	91
Mumps	33	50	83
Gonorrhea	129	65	194
Syphilis	59	8	67
German Measles	4	..	4
Epidemic Cerebro Spinal meningitis.....	11	9	20
Acute Anterior Poliomyelitis	80	20	100
Ophthalmia Neonatorum	74	4	78
Trachoma	15	7	22
Tetanus	3	1	4
Malaria	4	1	5
Paratyphoid Fever	1	..	1
Dysentery	1	1	2
Continued Fever .....	..	1	1
Septic Sore Throat .....	..	3	3
Total	2,505	1,099	3,604

COMMUNICABLE DISEASES, AUGUST 1915.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
ADAMS COUNTY—										
Manchester	Vil.		1							
Peebles	Vil.			1						
Seaman	Vil.	2			2					
Meigs	Tp.			2						
Sprigg	Tp.		2							
ALLEN COUNTY—										
Delphos		1	1		2			2		
Lima		2	1	10	2		1			
Lafayette	Vil.				9					1
Spencerville	Vil.		1							
Monroe	Tp.		2							
ASHLAND COUNTY—										
Ashland			1							
Hayesville	Vil.		1							
ASHTABULA COUNTY—										
Ashtabula		2		4	1					
Conneaut		1		1						
Jefferson	Vil.	2		1						
Denmark	Tp.	1								
Geneva	Tp.	1								
Monroe	Tp.				6			1		
Richmond	Tp.	1								
ATHENS COUNTY—										
Athens			1							
Nelsonville			1	1						
Jacksonville	Vil.						1			
Athens	Tp.		1							
Trimble	Tp.		1							
York	Tp.			1						
AUGLAIZE COUNTY—										
Wapakoneta			2	2						
Minster	Vil.						1			
Pusheta	Tp.							2		
Washington	Tp.		1							
BELMONT COUNTY—										
Bellaire			5			1	2			
Barnesville	Vil.		3		5					
Belmont	Vil.				2					
Bridgeport	Vil.				1	2				1
Shadyside	Vil.		1							
Colerain	Tp.		1	2			1			
Pease	Tp.						1			
Pultney	Tp.		6							
Wayne	Tp.						1			
BROWN COUNTY—										
Aberdeen	Vil.				2					
Ripley	Vil.	1								
Sardinia	Vil.		1							
Pike	Tp.	2								
Union	Tp.	1								
BUTLER COUNTY—										
Hamilton		9	2							
Middletown			1	6						
Somerville	Vil.	1								
Morgan	Tp.	1								
Reily	Tp.							1		
Ross	Tp.		1							
Union	Tp.		1							
Wayne	Tp.		1							
CARROLL COUNTY—										
Sherodsville	Vil.		2							
Monroe	Tp.		1							
Orange	Tp.		2							

COMMUNICABLE DISEASES, AUGUST 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
CHAMPAIGN COUNTY—										
Urbana					1					
Jackson	Tp.						1			
Rush	Tp.									2
Salem	Tp.									
Urbana	Tp.	1								
CLARK COUNTY—										
Springfield	Tp.	9		6	11	1	7	7		5
Green	Tp.		2							
Mad River	Tp.			1						
Springfield	Tp.									3
CLERMONT COUNTY—										
Milford	Vu.			3						
Goshen	Tp.			1			1			
Miami	Tp.	1								
Stonelick	Tp.				1					
Union	Tp.		1	3						
Wayne	Tp.				3					
CLINTON COUNTY—										
Martinsville	Vu.		1							
Sabina	Vu.	1		2						
Adams	Tp.						1			
Jefferson	Tp.	2								
COLUMBIANA COUNTY—										
East Liverpool		1	5				2			
Wellsville									1	
East Palestine	Vu.		1			3				
Lisbon	Vu.		2	1						
Salineville	Vu.						3			
Butler	Tp.		1							
Center	Tp.			2						
Knox	Tp.		1		1					
Madison	Tp.			1						
West	Tp.							1		
Yellow Creek	Tp.								8	
COSHOCTON COUNTY—										
Coshocton			3						1	
CRAWFORD COUNTY—										
Bucyrus			3							
Galion				4						
New Washington	Vu.					2				
CUYAHOGA COUNTY—										
Cleveland		138	38	66	140	131	96	24	23	5
East Cleveland				2	1	13	1	3	1	
Lakewood		2		1	1	1				
Bedford	Vu.				1					
Chagrin Falls	Vu.									1
Cleveland Heights	Vu.					1				
Newburgh Heights	Vu.			1						
West Park	Vu.						2			
Bedford	Tp.			1		1				
Euclid	Tp.		1							
Strongsville	Tp.				1					
DARKE COUNTY—										
Greenville		1								
Ansonia	Vu.			2						
Arcanum	Vu.			2						
Pittsburg	Vu.			1						
Union City	Vu.			1						
Versailles	Vu.						1			
Yorkshire	Vu.					3				
Adams	Tp.						1			
Allen	Tp.	1	1							1
Mississinawa	Tp.	1								

COMMUNICABLE DISEASES, AUGUST 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
DARKE COUNTY—Concluded—										
Monroe	<i>Tp.</i>		2							
Wayne	<i>Tp.</i>						1			
DEFIANCE COUNTY—										
Defiance			3	1						
Adams	<i>Tp.</i>						1			
Defiance	<i>Tp.</i>				10					
Hicksville	<i>Tp.</i>		2							
Washington	<i>Tp.</i>		1							
DELAWARE COUNTY—										
Concord	<i>Tp.</i>				10					
Porter	<i>Tp.</i>		1							
Trenton	<i>Tp.</i>		1							
ERIE COUNTY—										
Sandusky		3	3	3	1	10			2	
Huron	<i>Vil.</i>			1						
Kelley's Island	<i>Vil.</i>					1				
Vermilion	<i>Vil.</i>				3	2				
Florence	<i>Tp.</i>	2			3	2				
Huron	<i>Tp.</i>			2						
FAIRFIELD COUNTY—										
Lancaster				1						
Amanda	<i>Vil.</i>		1							
Amanda	<i>Tp.</i>		3							
Rush Creek	<i>Tp.</i>			1	2					
FAYETTE COUNTY—										
Washington C. H.			3							
Octa	<i>Vil.</i>		2							
Green	<i>Tp.</i>		3							
Jasper	<i>Tp.</i>		1							
Jefferson	<i>Tp.</i>		1							
FRANKLIN COUNTY—										
Columbus		26	24	22	18		15	1		
Grandview Heights	<i>Vil.</i>			1						
Reynoldsburg	<i>Vil.</i>		2							
Westerville	<i>Vil.</i>				4					
Hanford	<i>Vil.</i>						1			
Blendon	<i>Tp.</i>				1					
Brown	<i>Tp.</i>							2		
Franklin	<i>Tp.</i>			1						
Marion	<i>Tp.</i>	1								
Norwich	<i>Tp.</i>		1							
Perry	<i>Tp.</i>			1		1				
Sharon	<i>Tp.</i>					3		1		
FULTON COUNTY—										
Archbold	<i>Vil.</i>				1					
Fayette	<i>Vil.</i>				7					
Swanton	<i>Vil.</i>				1					
Dover	<i>Tp.</i>		1							
Gorham	<i>Tp.</i>				5					
GALLIA COUNTY—										
Gallipolis						1				
Addison	<i>Tp.</i>		1							
Cheshire	<i>Tp.</i>						5			
Gallipolis	<i>Tp.</i>	1	1							
Walnut	<i>Tp.</i>			2						
GEAUGA COUNTY—										
Chardon	<i>Vil.</i>		1		5					
Auburn	<i>Tp.</i>						1			
Newberry	<i>Tp.</i>	1				2				
GREENE COUNTY—										
Xenia			2				1			
Clifton	<i>Vil.</i>					1				
Yellow Springs	<i>Vil.</i>		1							

COMMUNICABLE DISEASES, AUGUST 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
GREENE COUNTY—Concluded—										
New Jasper	<i>Tp.</i>				5					
Xenia	<i>Tp.</i>			2						
GUERNSEY COUNTY—										
Cambridge		1	8	1			1			
Pleasant City	<i>Vil.</i>								8	
Cambridge	<i>Tp.</i>		1	1			3			
Millwood	<i>Tp.</i>		1							
Monroe	<i>Tp.</i>	1								
Valley	<i>Tp.</i>		1							
Westland	<i>Tp.</i>						1			
HAMILTON COUNTY—										
Cincinnati	126		17	51	27	46	16	14	5	3
Norwood	2			6	1		2			
St. Bernard			1							
Glendale	<i>Vil.</i>			1						
Lockland	<i>Vil.</i>				1					
Newtown	<i>Vil.</i>					1				
Reading	<i>Vil.</i>		1	1			4			
Sharonville	<i>Vil.</i>	1								
Delhi	<i>Tp.</i>			1			1			4
Whitewater	<i>Tp.</i>	1	1							
HANCOCK COUNTY—										
Findlay	1		3	1		1				
Madison	<i>Tp.</i>		1							
Pleasant	<i>Tp.</i>			2						
Union	<i>Tp.</i>	1								
HARDIN COUNTY—										
Kenton	2			8						
Ada	<i>Vil.</i>				5				5	
Alger	<i>Vil.</i>		2		5					1
Forest	<i>Vil.</i>		1							
McGuffey	<i>Vil.</i>	1	1							2
McDonald	<i>Tp.</i>		1							
Marion	<i>Tp.</i>		2							
HARRISON COUNTY—										
Cadiz	<i>Vil.</i>				4					
Cadiz	<i>Tp.</i>	1	1							
Green	<i>Tp.</i>				1					
HENRY COUNTY—										
Deshler	<i>Vil.</i>			2						
Holgate	<i>Vil.</i>	1								
Damascus	<i>Tp.</i>	1								
Flat Rock	<i>Tp.</i>		1							
Harrison	<i>Tp.</i>					2				
Liberty	<i>Tp.</i>		1							
Pleasant	<i>Tp.</i>				4					
HIGHLAND COUNTY—										
Greenfield	<i>Vil.</i>	1			2					
New Market	<i>Tp.</i>			1						
HOCKING COUNTY—										
Logan	<i>Vil.</i>						1			
Murray	<i>Vil.</i>		1	1						
Benton	<i>Tp.</i>									
Starr	<i>Tp.</i>			1						
Ward	<i>Tp.</i>		4							
Washington	<i>Tp.</i>					4				
HOJMES COUNTY—										
Knox	<i>Tp.</i>					2				
Walnut Creek	<i>Tp.</i>							3		
HURON COUNTY—										
Bellevue	1					1				
Norwalk			1			1	1			3
Greenwich	<i>Vil.</i>								8	

COMMUNICABLE DISEASES, AUGUST 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
HURON COUNTY—Concluded—										
New London	<i>Vil.</i>		8							
Greenwich	<i>Tp.</i>								1	
JACKSON COUNTY—										
Jackson				1						
Bloomfield	<i>Tp.</i>		1							
Milton	<i>Tp.</i>		1							
JEFFERSON COUNTY—										
Steubenville			17	2			3			
Empire	<i>Vil.</i>			3						
Cross Creek	<i>Tp.</i>	1	1							
Salem	<i>Tp.</i>						1			
Warren	<i>Tp.</i>			1						
Wayne	<i>Tp.</i>			1						
Wells	<i>Tp.</i>				20					
KNOX COUNTY—										
Mt. Vernon			7	1						
Union	<i>Tp.</i>		1							
LAKE COUNTY—										
Painesville		8								
Mentor	<i>Vil.</i>				1					
Mentor	<i>Tp.</i>				8					
LAWRENCE COUNTY—										
Ironton		1	2				1			
Mason	<i>Tp.</i>			9						
Symmes	<i>Tp.</i>			2						
LICKING COUNTY—										
Newark		4	1				1	5		
Johnstown	<i>Vil.</i>		1							
Etna	<i>Tp.</i>		3							
Fallsburg	<i>Tp.</i>	1	1							
Madison	<i>Tp.</i>					4		1	1	
LOGAN COUNTY—										
Bellefontaine			1		1					1
West Mansfield	<i>Vil.</i>	1								
Harrison	<i>Tp.</i>						2			
Rush Creek	<i>Tp.</i>			1						
Washington	<i>Tp.</i>		1							
LORAIN COUNTY—										
Elyria				2					4	
Lorain		1	4	2	5		1			
Amherst	<i>Vil.</i>						1			
Grafton	<i>Vil.</i>								1	
Rochester	<i>Vil.</i>				1					
Elyria	<i>Tp.</i>				1					
Grafton	<i>Tp.</i>	1			5				4	
LaGrange	<i>Tp.</i>								1	
Ridgeville	<i>Tp.</i>			3					1	
LUCAS COUNTY—										
Toledo		44	1	52	11	116	8	5	1	15
Waterville	<i>Vil.</i>			2				2		
Adams	<i>Tp.</i>			1						
Spencer	<i>Tp.</i>				1					
Swanton	<i>Tp.</i>				1					
Washington	<i>Tp.</i>	1		1						
MADISON COUNTY—										
London	<i>Vil.</i>			1			1			
Darby	<i>Tp.</i>	1								
Paint	<i>Tp.</i>			1					1	
Pike	<i>Tp.</i>			1		5				
Somerford	<i>Tp.</i>						1			
MAHONING COUNTY—										
Youngstown		10	3	9	5	106	6	8		3
East Youngstown	<i>Vil.</i>	1	1		1		2	1		3

COMMUNICABLE DISEASES, AUGUST 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MAHONING COUNTY—Concluded—										
Lowellville	Vil.	1					1			
Poland	Vil.				1					4
Struthers	Vil.			1						2
Beaver	Tp.				1					2
Berlin	Tp.				2					2
Boardman	Tp.	1			10			4		6
Ellsworth	Tp.		3							
Poland	Tp.					2		1		
Springfield	Tp.					1				
MARION COUNTY—										
Caledonia	Vil.		2							
Marion	Tp.		7							
Pleasant	Tp.					1				
Tully	Tp.						4			
MEDINA COUNTY—										
Wadsworth	Vil.						3			
Granger	Tp.		1							
Hinckley	Tp.		1							
Lafayette	Tp.	1								
Montville	Tp.					1				
Westfield	Tp.		1							
MEIGS COUNTY—										
Middleport	Vil.		1	1						
MERCER COUNTY—										
Coldwater	Vil.		3						3	
Butler	Tp.		3							
Granville	Tp.		1							
Marion	Tp.		3							
Recovery	Tp.							1		
Union	Tp.		1							
MIAMI COUNTY—										
Piqua		4	1		2	6				
Casstown	Vil.			1						
Covington	Vil.									1
West Milton	Vil.			2						
Brown	Tp.					1				
Lost Creek	Tp.			1						
Spring Creek	Tp.			1						
Union	Tp.			1						
MONROE COUNTY—										
Beallsville	Vil.						1			
Stafford	Vil.		1							
Lee	Tp.		1							
Perry	Tp.		1							
MONTGOMERY COUNTY—										
Dayton		18	3	36	13	48	10	7		2
Jackson	Tp.	1		1						
Madison	Tp.			1						
Perry	Tp.	1		2		1				
Washington	Tp.					1				
MORGAN COUNTY—										
Malta	Vil.	1								
Stockport	Vil.			1						
Center	Tp.	1		1						
Malta	Tp.					4				
Meigsville	Tp.			2						
Penn	Tp.	1								
Union	Tp.					2				
MORROW COUNTY—										
Mt. Gilead	Vil.		1							
Bennington	Tp.		1							
Chester	Tp.			1						
South Bloomfield	Tp.	1		2						
Westfield	Tp.			1						

COMMUNICABLE DISEASES, AUGUST 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MUSKINGUM COUNTY—										
Zanesville	1		6		4		2			
Fazeysburg	Vil.									1
Roseville	Vil.		1		1					
Falls	Tp.			1						
Madison	Tp.				2					
Meigs	Tp.		1							
Perry	Tp.				1					
Springfield	Tp.						1			
Union	Tp.		1		1					
Wayne	Tp.				2					1
NOBLE COUNTY—										
Caldwell	Vil.		1							
Buffalo	Tp.								7	
Center	Tp.				5					
Jefferson	Tp.				5					
Seneca	Tp.				23					
OTTAWA COUNTY—										
Marblehead	Vil.	1								
Port Clinton	Vil.	5								
Bay	Tp.	3								
Benton	Tp.						1			
Danbury	Tp.	1								2
Portage	Tp.	1								
PERRY COUNTY—										
Corning	Vil.				2					
New Lexington	Vil.		1				1			
New Straitsville	Vil.				5					
Thornville	Vil.				18					
Jackson	Tp.	4			6					
PICKAWAY COUNTY—										
Circleville				2		4				
Ashville	Vil.	1		1						
Harrison	Tp.		1							
Jackson	Tp.		1							
PIKE COUNTY—										
Pebble	Tp.				2	2				1
Pee Pee	Tp.	1								
PORTAGE COUNTY—										
Ravenna				1						
Kent	Vil.			4						
Aurora	Tp.			1						
Franklin	Tp.					1				
Mantua	Tp.								1	
PREBLE COUNTY—										
Eaton	Vil.		3							
New Paris	Vil.		1							
Harrison	Tp.		1							
PUTNAM COUNTY—										
Columbus Grove	Vil.		2				1			
West Leipsic	Vil.	1								
Blanchard	Tp.	1								
Liberty	Tp.		1							
Pleasant	Tp.		1							
Riley	Tp.	1	2							
RICHLAND COUNTY—										
Mansfield			5	3			2			
Bellville	Vil.					1				
Shelby	Vil.		1							
Franklin	Tp.		1							
Jefferson	Tp.					2				
Perry	Tp.					2				
ROSS COUNTY—										
Chillicothe		2		2		2	4			3
Jefferson	Tp.			1						

COMMUNICABLE DISEASES, AUGUST 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
ROSS COUNTY—Concluded—										
Liberty .....Tp.	1									
Twin .....Tp.			1							6
SANDUSKY COUNTY—										
Fremont .....Tp.	4		1	2	3			1		3
Woodville .....Vil.				1						
Ballville .....Tp.	1				8			1		
Washington .....Tp.			1							
Portage .....Tp.				2						
SCIOTO COUNTY—										
Portsmouth .....Tp.			3	2			3			
Green .....Tp.			1							
Morgan .....Tp.	1									
Porter .....Tp.			11	1		1				
SENECA COUNTY—										
Tiffin .....Tp.			1	1	1	1				
Adams .....Tp.	1									
Hopewell .....Tp.										1
Pleasant .....Tp.						11				
Seneca .....Tp.			1							
Venice .....Tp.		1								1
SHELBY COUNTY—										
Sidney .....Tp.			3			1				
Cynthiana .....Tp.							3			
Dinsmore .....Tp.				4						
Perry .....Tp.				1						
STARK COUNTY—										
Alliance .....Tp.	4	1		1			1			
Canton .....Tp.	4		3	3		1	6		1	
Massillon .....Tp.				6						
Brewster .....Vil.			1					2		
Minerva .....Vil.										
Nimishillen .....Tp.				2						
Osnaburg .....Tp.							1			
Perry .....Tp.				1						
Plain .....Tp.							1			
Sugar Creek .....Tp.			2							
SUMMIT COUNTY—										
Akron .....Tp.	2		12	6		2	2		4	
Barberton .....Tp.			1			1	5			
Cuyahoga Falls .....Vil.	2		1	1						
Mogadore .....Vil.	1									
Bath .....Tp.				2			1			
Portage .....Tp.			1							
Stowe .....Tp.			1	1						
TRUMBULL COUNTY—										
Niles .....Tp.		1		2						
Warren .....Tp.			1			3				3
Bristol .....Tp.							1			
Farmington .....Tp.			1							
Hubbard .....Tp.										5
Liberty .....Tp.						4				
Mesopotamia .....Tp.			1							
Vernon .....Tp.						1				
Vienna .....Tp.						4				
TUSCARAWAS COUNTY—										
Canal Dover .....Tp.			1							
New Philadelphia .....Tp.							3			
Dennison .....Vil.	2		2	3						
Mineral City .....Vil.				1						
Stone Creek .....Vil.					1					
Strasburg .....Vil.				3						
Bucks .....Tp.			1		7					

COMMUNICABLE DISEASES, AUGUST 1915—Concluded.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of August 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
TUSCARAWAS COUNTY—										
Fairfield	Tp.			1						
Franklin	Tp.			3						
Jefferson	Tp.				1					
Lawrence	Tp.			1						
Mill	Tp.			1						
Perry	Tp.		1							
Sandy	Tp.			1						
Warwick	Tp.		1							
UNION COUNTY—										
Richwood	Vil.		3					1		
Liberty	Tp.				1					
Mill Creek	Tp.		2							
Union	Tp.				4					
VAN WERT COUNTY—										
Van Wert			1					2		
Convoy	Vil.		2				1			
Elgin	Vil.				1					
Washington	Tp.	1								
Willshire	Tp.	1								
York	Tp.	1								
WARREN COUNTY—										
Franklin	Vil.						1			
Waynesville	Vil.				1					
WASHINGTON COUNTY—										
Marietta							1			
Belpre	Vil.			1					1	
Dunham	Tp.		1							
Muskingum	Tp.		1							
Salem	Tp.		3							
Warren	Tp.		2							1
Waterford	Tp.	2								
WAYNE COUNTY—										
Burbank	Vil.				3					
Rittman	Vil.						1			
Wayne	Tp.						1			
WILLIAMS COUNTY—										
Bryan	Vil.		2							
Edgerton	Vil.			1						
Montpelier	Vil.									
Stryker	Vil.	1								
Northwest	Tp.									
Springfield	Tp.	1								
Superior	Tp.		2	1						
WOOD COUNTY—										
Bowling Green			2	1						
Perrysburg	Vil.				4					
Wallbridge	Vil.		1							
Bloom	Tp.						1			
Center	Tp.						1			
Ross	Tp.				6					
Washington	Tp.						1			
WYANDOT COUNTY—										
Carey	Vil.	1		1						
Upper Sandusky	Vil.				6					
Crane	Tp.		2		1					
Pitt	Tp.	1								
Sycamore	Tp.		1							

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, AUGUST 1915.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
ALLEN COUNTY—								
Lima	2	2						
Spencerville	Vil.							
Bath	1							
Spencer	1							
ASHTABULA COUNTY—								
Jefferson	Vil.	1						
Austinburg	1							
Jefferson	1							
ATHENS COUNTY—								
Athens	1							
Nelsonville		1						
Canaan	1							
AUGLAIZE COUNTY—								
New Knoxville	1							
BELMONT COUNTY—								
Pultney	1							
BROWN COUNTY—								
Pleasant	1							
BUTLER COUNTY—								
Hamilton	3	1						
Middletown	1	1					1	
CARROLL COUNTY—								
Carrollton				2				
CLARK COUNTY—								
Springfield		1						
COLUMBIANA COUNTY—								
East Liverpool	6	1						
Liverpool	1						1	
CLINTON COUNTY—								
Sabina	Vil.							a1
CUYAHOGA COUNTY—								
Cleveland	1	4		7	38	51	8	b1 c2
Cleveland Heights	Vil.				2			
Olmstead	1				3			
ERIE COUNTY—								
Sandusky					1			
FAIRFIELD COUNTY—								
Carroll	Vil.	2						
FAYETTE COUNTY—								
Bloomingsburg	Vil.	1	2					
Green	1							
Jasper	1							
FRANKLIN COUNTY—								
Columbus	15	2						
FULTON COUNTY—								
Archbold	Vil.	1						
Swanton	Vil.	2						
GALLIA COUNTY—								
Gallipolis	1							
GUFERNSEY COUNTY—								
Cambridge	1							
Monroe	1							
HAMILTON COUNTY—								
Cincinnati	21	23	2	1	2	2		
Norwood	1							
Addyston	1	1						
HANCOCK COUNTY—								
Findlay							1	
HARDIN COUNTY—								
Ada	Vil.				1			
Forest	Vil.	1						
McDonald	1						1	
Marion	1							1

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, AUGUST 1915 — Continued.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
HARRISON COUNTY—								
Cadiz .....Tp.	2							
Monroe .....Tp.	2							
HENRY COUNTY—								
Damascus .....Tp.	1							
Liberty .....Tp.	1							
HIGHLAND COUNTY—								
Greenfield .....Vil.	5							
HURON COUNTY—								
Norwalk								bl
Greenwich								cl
JEFFERSON COUNTY—								
Mingo Junction .....Vil.					2			
Richmond .....Vil.								dl
Steubenville .....Tp.					4			
LAWRENCE COUNTY—								
Proctorville				1				
LICKING COUNTY—								
Granville .....Vil.	3							
Fallsburg .....Tp.	2							
LOGAN COUNTY—								
Bellefontaine		1	1					
LORAIN COUNTY—								
Lorain .....Tp.	4							cl
Avon Lake					1			
LUCAS COUNTY—								
Toledo .....Tp.	43	16	1	1		16	3	cl
MADISON COUNTY—								
London .....Vil.	1							
MAHONING COUNTY—								
Youngstown .....Tp.	7	3				1	2	bl dl
East Youngstown .....Vil.	3						4	cl
Sebring .....Vil.				1				
Beaver .....Tp.	1							
MARION COUNTY—								
Waldo .....Tp.								al
MEDINA COUNTY—								
Wadsworth .....Tp.					1			
MEIGS COUNTY—								
Sutton .....Tp.	1							
MIAMI COUNTY—								
Bethel .....Tp.				1				
MONTGOMERY COUNTY—								
Dayton .....Tp.	8	1		1				
German .....Tp.	1							
Perry .....Tp.	1							
MORROW COUNTY—								
South Bloomfield .....Tp.						1		
MUSKINGUM COUNTY—								
Zanesville .....Vil.	1	1				1		
Painesburg .....Vil.	1							
Roseville .....Tp.							1	
Licking .....Tp.	2							
Meigs .....Tp.								
OTTAWA COUNTY—								
Danbury .....Tp.	1							
Portage .....Tp.		1						
PAULDING COUNTY—								
Cecil .....Vil.		1						
PICKAWAY COUNTY—								
Darbyville .....Vil.	1							
Muhlenberg .....Tp.	1							
PUTNAM COUNTY—								
Columbus Grove .....Vil.	1							

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, AUGUST 1915 — Concluded.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
RICHLAND COUNTY—								
Mansfield	2				1			
Butler	<i>Vil.</i>				2			
ROSS COUNTY—								
Chillicothe	10	1				1		
Twin	<i>Tp.</i>	1						
SANDUSKY COUNTY—								
Fremont	3							
SCIOTO COUNTY—								
Niles	<i>Tp.</i>							<i>b1</i>
SENECA COUNTY—								
Seneca	<i>Tp.</i>	1						
Verice	<i>Tp.</i>	1						
SHELBY COUNTY—								
Perry	<i>Tp.</i>	1						
STARK COUNTY—								
Alliance				1	5			
Canton		1			23		1	
SUMMIT COUNTY—								
Akron					7	1	4	
Barberton					2			
Bath	<i>Tp.</i>			2				
Coventry	<i>Tp.</i>				1			
Springfield	<i>Tp.</i>				1			
Stowe	<i>Tp.</i>				1			
Twinsburg	<i>Tp.</i>			1				
TRUMBULL COUNTY—								
Warren							1	
Johnston	<i>Tp.</i>							<i>e1</i>
TUSCARAWAS COUNTY—								
Canal Dover					1			
New Philadelphia	1							
Dennison	<i>Vil.</i>						1	
Uhrichsville	<i>Vil.</i>			1				
Bucks	<i>Tp.</i>	1			1			
WASHINGTON COUNTY—								
Dunham	<i>Tp.</i>	1						
Muskingum	<i>Tp.</i>	1						
Warren	<i>Tp.</i>	2						
WOOD COUNTY—								
Bowling Green								<i>f1</i>
Ross	<i>Tp.</i>	2						

a Septic Sore Throat. *b* Tetanus. *c* Malaria. *d* Dysentery. *e* Continued Fever.
f Paratyphoid Fever.

PUBLICATIONS OF THE OHIO STATE BOARD OF HEALTH.

Annual Reports.

1886, 87, 88, 89*, 90, 91, 92, 93, 94*, 95*, 96, 97, 98*, 99*, 1900, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12.

*Sanitary Record (Monthly), 1888 to 1894. Vol. 1 to Vol. 7.

*Ohio Sanitary Bulletin (Quarterly), 1895 to 1896. Vol. 1 and 2.

*Ohio Sanitary Bulletin (Monthly), 1897 to 1908. Vol. 1 to Vol. 12.

Quarterly Bulletin, Ohio State Board of Health, 1909 and 1910. Vol. 1 and 2.

Monthly Bulletin, Ohio State Board of Health, 1911, 12, 13, Vol. 1, 2, 3, (Volumes not complete).

Special Reports.

*Sources of Public Water Supplies of Ohio, Preliminary Reports. Vols. 1-5. 1897 to 1902 inclusive.

*Water and Sewage Purification in Ohio. 1 Vol. 1908.

Report on Wastes Disposal. 1 Vol. 1910.

Report of the Flood of March, 1913. 1 Vol. 1913. Reprinted from Monthly Bulletin.

Report on Public Water Supplies on the Ohio River, by M. Z. Bair. 116 pages. April, 1915.

Division of Administration.

Laws of Ohio Relating to the Powers and Duties of Boards of Health. 91 pp. 1912.

Legal Powers of Boards of Health, by James E. Bauman, 7 p.

Reprint Monthly Bulletin, November 1912.

Rules and By-laws, Ohio State Board of Health, December 1912.

The Problems of Public Health, by E. F. McCampbell, 29 p.

Reprint Monthly Bulletin, November and December 1912 and January 1913.

The Control of Communicable Disease by the Municipality, by E. F. McCampbell, 12 p. Reprint Monthly Bulletin, April 1913.

The Teacher's Work in the Field of Public Health, by E. F. McCampbell, 9 p. Reprint Monthly Bulletin, June 1913.

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The Abatement of Nuisances, by James E. Bauman, 13 p. Reprint Monthly Bulletin, September 1913.

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The Conservation of Public Health, by E. F. McCampbell, 16 p. Reprint Monthly Bulletin, January 1914.

The Relationship of the Dentist to the Problems of Public Health, by E. F. McCampbell, 12 p. Reprint Monthly Bulletin, February 1914.

* Out of print.

- The Notification of Reportable Diseases, by James E. Bauman. Reprint Monthly Bulletin, April 1914.
- Legal Procedures a Nurse Should Know, by James E. Bauman, 6 p. Reprint Monthly Bulletin, June 1914.
- Rural Sanitation, by John W. Hill, 7 p. Reprint Monthly Bulletin, July 1914.
- The Relation of the Funeral Director and Embalmer to the Public Health, by E. F. McCampbell, 10 p. Reprint Monthly Bulletin, July 1914.
- Orders and Regulations for Villages and Townships, by James E. Bauman, 18 p. Reprint Monthly Bulletin, August 1914.
- Medical Education in Hygiene and Public Health, by E. F. McCampbell, 10 p. Reprint Monthly Bulletin, November 1914.
- How Rural Health Officers Can Assist City Health Departments, by J. H. Landis. Reprint Monthly Bulletin, December 1914.
- Health Improvements Needed in Ohio, by H. T. Sutton, 9 p. Reprint Ohio Public Health Journal, February 1915.
- Diseases Notifiable in Ohio, Regulations Governing Reports. 11 p. May, 1915.
- The Health Department Under the Commission-Manager Form of Government, by J. R. McDowell, 6 p. Reprint, O. P. H. J., July, 1915.

Division of Communicable Diseases.

- Reports of Contagious and Infectious Diseases. 4 p. 1912.
- Disinfection and Disinfectants. 4th edition. 11 p. 1908.
- Important Facts about Common Transmissible Diseases. 24 p. 1913.
- Smallpox, Its Restriction and Prevention. 7 p. Revised. 1913.
- Scarlet Fever, Its Restriction and Prevention. 8 p. 1911.
- Typhoid Fever, Its Prevention and Restriction. 8 p. 1911.
- Diphtheria and Membranous Croup, Their Prevention and Restriction. 8th edition. 8 p. 1913.
- The Cause and Prevention of Venereal Diseases, 4 p. 2nd edition. 1909.
- Acute Poliomyelitis and Cerebro-spinal Meningitis; Problems for the Rural Health Officer, by Frank G. Boudreau. 17 p. Reprint, Monthly Bulletin, December 1912.
- *Insects and the Transmission of Disease, by C. K. Brain, 20 p. Reprint Monthly Bulletin, February 1913.
- What the Teacher Should Know About Communicable Diseases, by Frank G. Boudreau, 11 p. Reprint Monthly Bulletin, July 1913.
- The Prevention of Smallpox in Townships and Villages, by Frank G. Boudreau, 10 p. Reprint Monthly Bulletin, Sept. 1913.
- Whooping Cough, Its Prevention and Restriction. 4 p. January 1914.
- Acute Poliomyelitis, with Special Reference to the Disease in Ohio, by Frank G. Boudreau, C. K. Brain, E. F. McCampbell. Reprint Monthly Bulletin, March 1914.
- The Duration of Quarantine in Transmissible Diseases. Frank G. Boudreau, 10 p. Reprint Monthly Bulletin, May 1914.
- The Trachoma Situation as It Concerns Ohio, by E. F. McCampbell, 11 p. Reprint Monthly Bulletin, July 1914.

*Out of print.

- Simple Facts About Common Diseases, by Frank G. Boudreau, 25 p. Reprint Monthly Bulletin, July 1914.
- An Outbreak of Typhoid Fever Due to Contamination of the Water Supply Through a Private Connection, by W. H. Dittoe and Frank G. Boudreau, 11 p. Reprint Monthly Bulletin, July 1914.
- Market Milk. An Important Factor in the Spread of Communicable Diseases, by Frank G. Boudreau, 18 p. Reprint Monthly Bulletin, August 1914.
- The Differential Diagnosis of Epidemic Cerebrospinal Meningitis, by Frank G. Boudreau. 6 p. Reprint Monthly Bulletin, November 1914.
- Methods and Channels of Infection, by E. F. McCampbell. Reprint Ohio Public Health Journal, January-February 1915.
- Immunity and Susceptibility, by E. F. McCampbell, 39 p. Reprint from Ohio Public Health Journal, March-May, 1915.
- Typhus Fever, Its Etiology and Methods of its Prevention, by John F. Anderson. 10 p. May, 1915.
- The Problem of Infant Mortality in Cities, by F. G. Boudreau and Sara Kerr. 16 p. Reprint from Ohio Public Health Journal, May, 1915.
- Limitations of Prevention of Communicable Diseases, by Martin Friedrich. 7 p. Reprint, O. P. H. Jour., June, 1915.
- Protective Inoculation Against Disease, by E. F. McCampbell, 18 p. Reprint, O. P. H. J., July, 1915.
- The Lessons from a Smallpox Epidemic, by Chas. A. LaMont, 8 p. Reprint, O. P. H. J., July, 1915.

Division of Tuberculosis.

- The Prevention of Consumption. 3rd edition. 6 p. 1910.
- How to Avoid Consumption. 6 p. 1911.
- Directions for Living and Sleeping in the Open Air. 24 p. 1913.
- A Survey of the Tuberculosis Situation in the State of Ohio. 49 p. 1912.
- Tuberculosis Equipment in the State of Ohio. 17 p. 1913.
- Tuberculosis—What You Should Know About It. 20 p. 2d edition. 1914.
- Open Air Schools, by Aug. F. Foerste, 26 p. Reprint Monthly Bulletin, March 1912.
- The Importance of Complete Birth Registration, by A. C. Holland, 10 p. Reprint Monthly Bulletin, July 1912.
- The Notification and Registration of Tuberculosis, by Robert G. Paterson, 10 p. Reprint Monthly Bulletin, Sept. 1912.
- Ohio and Its Tuberculosis Problem, by Robert G. Paterson, 11 p. Reprint Monthly Bulletin, November 1912.
- The Municipal Health Officer in Relation to Tuberculosis, by Robert G. Paterson. 8 p. Reprint Monthly Bulletin, February 1913.
- The Relation of Animal to Human Tuberculosis, by E. C. Schroeder, 14 p. Reprint Monthly Bulletin, July 1913.
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- Present Status of the Tuberculosis Work in Cleveland, by R. H. Bishop, Jr., M. D., 16 p. Reprint Monthly Bulletin, June 1914.

- Tuberculosis in State Institutions, by Starr Cadwallader, 4 p. Reprint Monthly Bulletin, June 1914.
- The State Health Department and the Tuberculosis Problem, by E. F. McCampbell. 21 p. Reprint Monthly Bulletin, October 1914.
- The Relation of Private and Municipal Anti-Tuberculosis Activities, by Isabel W. Lowman. 10 p. Reprint Monthly Bulletin, November 1914.
- The Value of the Public Health Nurse to Local Health Authorities, by R. G. Paterson, 7 p. Reprint Monthly Bulletin, September 1914.
- What I Learned About Tuberculosis, by Austin M. Patterson, 8 p. Reprint Ohio Public Health Journal, February 1915.
- Public Health Organizations and Nurses in Ohio. 15 p. February, 1915.
- The Tuberculosis Problem, by J. H. Landis. 11 p. Reprint from Ohio Public Health Journal, March, 1915.
- Public Health Nursing in Ohio, by Helena R. Stewart. 8 p. Reprint from Ohio Public Health Journal, April, 1915.
- Public Health Nursing in Ohio, by R. G. Paterson and Helena R. Stewart. 24 p. May, 1915.

Division of Hygienic Laboratories.

- Information Concerning the Hygienic Laboratories.
- Outfits for Chemical and Bacteriological Field Determinations, by L. H. Van Buskirk, 10 p. Reprint Monthly Bulletin, April 1913.
- The Uses of a Public Health Laboratory, by Fred Berry, 12 p. Reprint Monthly Bulletin, April 1913.
- Diphtheria, with Special Reference to the Bacteriology of this Disease, by Fred Berry. 84 p. Reprint Monthly Bulletin, March 1914.
- Certain Foods and their Relation to Disease, by Martha Koehne. 13 p. Reprint from Ohio Public Health Journal. April, 1915.
- The Sanitary Survey; What It Is, by L. H. VanBuskirk. 6 p. Reprint from O. P. H. Jour., August, 1915.
- Some Filtration Plant Bacteriological Data, by R. D. Scott. 8 p. Reprint, O. P. H. Jour., June, 1915.

Division of Industrial Hygiene.

- How About Your Work? 4 p. 1913.
- The Significance of Occupational Diseases and Their Classification. 10 p. Reprint Monthly Bulletin, June 1913.
- The Span of Life in Some Occupations in the State of Ohio. 6 p. Reprint Monthly Bulletin, July 1913.
- Occupational Diseases in their Relation to Rural Districts. 9 p. Reprint Monthly Bulletin, September 1913.
- Plumbism in the Industries of the Middle West, by Alice Hamilton, 11 p. Reprint Monthly Bulletin, Jan.-Feb. 1913.
- Occupational Diseases, by H. B. Blakey. 10 p. Reprint Monthly Bulletin. March 1913.
- Consumption and Preventable Deaths in American Occupations. 10 p. Reprint, with rearrangements. Monthly Bulletin, July and August 1913.
- Industrial Poisons. 33 p. Reprint Monthly Bulletin, December 1913.

- Laws of Ohio Relating to Occupational Disease and Industrial Hygiene. 30 p. 1913.
- Health Hazards of Industries, by E. R. Hayhurst. Reprint Monthly Bulletin, April 1914.
- Lead Poisoning—Its Chief Causes with Observations on Its Diagnosis and Prevention. 11 p. E. R. Hayhurst. Reprint Monthly Bulletin, May 1914.
- Occupational Brass Poisoning: "Brass Founders' Ague." 16 p. by E. R. Hayhurst. Reprint Amer. Jour. of the Medical Sciences, May 1913.
- Critical Examination of 100 Painters for Evidence of Lead Poisoning, by E. R. Hayhurst, 16 p. Reprint, American Journal of the Medical Sciences, June 1914.
- The Standardization of a Method for the Detection of Lead in Urine, by Charles A. Parkinson. 8 p. Reprint Monthly Bulletin, October 1914.
- Report on Investigation of Four Cases of Sudden Death at Athens State Hospital, September 19, 1914, by E. R. Hayhurst and Ernest Scott. 8 p. Reprint Monthly Bulletin, October 1914.
- A Survey of Industrial Health Hazards and Occupational Diseases in Ohio, by E. R. Hayhurst, February, 1915. 438 p. 101 illus.
- The Industrial Hygiene of Factory Processes (General), in Ohio, by E. R. Hayhurst, 9 p. Reprinted from Ohio Public Health Journal, January 1915.
- A Survey of the Industrial Hygiene of Furnacing. Forging and Blacksmithing. Coremaking, Iron Founding and Brass Founding, by E. R. Hayhurst. 15 p. Reprinted from Ohio Public Health Journal. February, 1915.
- A Survey of the Industrial Hygiene of Metal Grinding, Sand Blasting and Polishing and Buffing, by E. R. Hayhurst. 12 p. Reprinted from Ohio Public Health Journal, March, 1915.
- A Survey of the Industrial Hygiene of Machine Shopping, Tempering, Brazing, Welding and Soldering, by E. R. Hayhurst. 11 p. Reprinted from Ohio Public Health Journal, April, 1915.
- A Survey of the Industrial Hygiene of Pickling, Galvanizing, Tinning. Acid Dipping, and Electroplating, by E. R. Hayhurst. 12 p. Reprinted from Ohio Public Health Journal, May, 1915.
- A Survey of the Industrial Hygiene of Mixing Chemicals; Wood Working; Gluing; Pasting and Labelling; Painting and Varnishing; and Shelacking and Lacquering, by E. R. Hayhurst. 11 p. Reprint O. P. H. Jour., June, 1915.
- A Survey of the Industrial Hygiene of Enameling, Japanning, Lithographing, Upholstering, Sewing, Ironing and Pressing, and Junk Sorting, by E. R. Hayhurst, 8 p. Reprint, O. P. H. J., July, 1915.
- A Survey of the Industrial Hygiene of Printing—Composing; Type Machines; Press Room Work; Binding; Etching; Etc., by E. R. Hayhurst. 9 p. Reprint, O. P. H. Jour., August, 1915.
- A Collection of Industrial Hygiene Aphorisms, by E. R. Hayhurst. 5 p. Reprint, O. P. H. Jour., August, 1915.

Division of Engineering.

- Report on an Examination of the Water Supplies of Thirteen Municipalities on the Ohio River in Ohio and West Virginia, by W. H. Dittoe, M. Z. Bair and R. F. MacDowell. 68 p. Reprint Monthly Bulletin, June 1913.
- The Disinfection of Water, by Roger G. Perkins, M. D., 9 p. Reprint Monthly Bulletin, March 1911.
- Algae and Their Relation to Public Water Supplies, by L. H. Van Buskirk. 6 p. Reprint Monthly Bulletin, August 1912.
- *Notes on the Hypochlorite Treatment of Public Water Supplies in the United States and Canada, by W. H. Dittoe and R. F. MacDowell. 9 p. Reprint Monthly Bulletin, Oct. 1912.
- Report on the Public Water Supply of Cleveland with Reference to the Treatment by Calcium Hypochlorite, by W. H. Dittoe and L. H. Van Buskirk. 44 p. Reprint Monthly Bulletin, January 1913.
- The Value of a Pure Water Supply, by W. H. Dittoe, 6 p. Reprint Monthly Bulletin, January 1913.
- The Disposal and Purification of Sewage, by C. B. Hoover, 10 p. Reprint Monthly Bulletin, October 1912.
- Collection and Disposal of Municipal Wastes, by Irwin S. Osborn, 6 p. Reprint Monthly Bulletin, September 1912.
- The Disposal of Municipal Wastes in Small Cities and Villages, by R. F. MacDowell. 9 p. Reprint Monthly Bulletin, November 1912.
- Privies and Cesspools for Residences in Unsewered Districts, by L. H. Van Buskirk. 12 p. Reprint Monthly Bulletin, August 1913.
- Deterioration of Public Water Supply and Sewerage Improvements, by L. H. Van Buskirk, 8 p. Reprint Monthly Bulletin, March 1913.
- Rural Sanitation, by W. H. Dittoe. 6 p. Reprint Monthly Bulletin, September 1913.
- *How to Control Nuisances, by W. H. Dittoe. 9 p. Reprint Monthly Bulletin, October 1911.
- Water Purification at Columbus. Charles P. Hoover. 25 p. Reprint O. P. H. Jour., June, 1915.
- The Present Status of Sanitary Engineering, by John W. Hill. 11 p. Reprint Monthly Bulletin, 1914.
- The Status of Stream Pollution and Sewage Treatment in Ohio, by W. H. Dittoe. 25 p. Reprint Monthly Bulletin, December 1913.
- The Benefits to Be Derived from a Public Water Supply and Sewerage System. W. H. Dittoe. 7 p. Reprint Monthly Bulletin, May 1914.
- The Engineering Work of the State Board of Health, by W. H. Dittoe. 5 p. Reprint Monthly Bulletin, June 1914.
- The Pollution of Streams in Ohio and the Effects of the Pollution on the Public Health, Live Stock, and Fish, by E. F. McCampbell and W. H. Dittoe. 17 p. Reprint Monthly Bulletin, October 1914.
- Relative Values of Improvements Affecting the Sanitation of Villages, by W. H. Dittoe. 6 p. Reprint Monthly Bulletin, October 1914.
- Public Water Supply for Cities—Some General Considerations, by W. H. Dittoe. 9 p. Reprint Monthly Bulletin, November 1914.

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THE MOVEMENT TO LENGTHEN LIFE.*

E. F. McCAMPBELL, PH. D., M. D.,

Secretary and Executive Officer, Ohio State Board of Health.

It has been frequently stated that the so-called span of human life may be lengthened. It is said that there is no obvious reason why a person should not live even ten and perhaps fifteen years longer, as indicated by the present life expectancy tables, if careful attention is given to personal health. In order to arrive at the facts, if possible, as well as a proper conception of the whole problem of health conservation, let us briefly investigate the situation. All thinking people have an interest in these matters. Aside from the humanitarian interest which we as men and women have in the conservation of human life, the question has certain definite economic and commercial aspects.

It has long been known that there existed a certain group of diseases affecting the human race which could be prevented if proper attention were given to the ordinary laws of right living and the established principles of sanitary science. The diseases of this group cause a large number of deaths annually in every civilized community, and in addition there occurs at least twice as many cases of preventable illness.

The knowledge of this situation would be all that one would think necessary to arouse public interest and action. Unfortunately, such is not universally the case. It has been shown that when the public is confronted with these facts alone only a limited response is effected. For example, when thinking people know that in Ohio, in 1913, 68,399 people died from all causes and that conservative tabulations and estimates show that of this number approximately 28,000 people died from diseases which modern science knows how to prevent, and that approximately 56,000 people were ill from preventable causes, it would seem that immediate action on the part of all the thinking citizenship of our state looking toward the correction of the situation would result.

Within the last five years the campaign for better health and for better living conditions has made progress. However, no general movement on the part of all our so-called public spirited citizens has yet been brought about. Again, when one investigates the exact causes underlying the progress which has been made a curious situation is noted. It has been said that education of the public was and is the key to the solution of all our public health problems. This is true to a limited extent. Education must be the basic factor beyond doubt for all advances in civilization. But what else do we find on analyzing the situation? What other factors are now operating in stimulating the interest of the business man and the everyday citizen? One finds that very wisely the public health officials and the voluntary propagandists are now calling attention to the economic and commercial phases of the question. The value of human life is hard to estimate from an economic standpoint. Political economists and business men have given and are now giving consideration to the question

*The material in this paper has been presented previously in editorials in The Ohio Public Health Journal. It is now brought together with some additions.

of public health from the plain and perhaps sometimes rather "cold-blooded" viewpoint of business. Certain life values have been worked out for the various trades and professions. Calculations have been made showing the relation of preventable diseases and accidents to general efficiency, and statistics have been tabulated showing as to the loss incurred to the individual, who may be either the employe or the employer. Large industries are interesting themselves in welfare work by no means for philanthropic reasons alone, but because of the commercial importance of the problem. The same is true of the large life insurance companies. The question of postponing as long as possible the death of a policyholder is essentially a commercial proposition with the life insurance companies.

In the earlier days sanitary reforms were brought about through panic which occurred coincident with or followed in the wake of devastating plagues. Historians have not given due weight to the prevalence of disease as a factor in the political and economic rise and fall of the ancient nations.

Nowadays we must measure the success of any and all movements for social betterment from the standpoint of economics, just as the success of any business must be measured on this basis. One must determine the commercial value of health conservation just as one measures the commercial value of the farm livestock or products or the output of a manufacturing plant. Philanthropic movements supported by voluntary contributions may lead the way to many needed reforms of a sanitary or social character, but such support can never be lasting unless the results can be measured in dollars and cents. In other words, the "acid test" to be applied to any movement, be it the public health movement or any other, is, "*does it pay?*" Granted, that a human life is of actual commercial value, it becomes a matter of grave importance to the state and to the nation to prevent unnecessary sickness and death. Again, bearing in mind the productiveness of an individual at the various periods of life, it is most certainly an affair for the serious concern of any government to devise ways and means of lengthening the life of its citizens.

The question will undoubtedly arise as to why, if it be true, that this question is of so much economic importance, there has been so slow a development of interest on the part of the general public. The following may be stated in this connection: It was commonly accepted for many years and the view is held by some at the present time that death follows the invariable laws of nature. It is stated that man has no control over these laws and that the Almighty is responsible for the death rates which prevail. It is perhaps true that man cannot control the actual laws of nature, but it has been demonstrated beyond any doubt that many of the laws of nature, which formerly were held invariable, may be materially modified. We now know that the Almighty has nothing whatever to do with the mortality in a community. The death rates of any community are determined by that community itself, that is, by the whole body social of that community. It has been well stated that defective sanitation in a community means defective civilization in that community. Every community can, within limits, determine its own death rates. One can even go further and say public health may be purchased by any community. It is a purchasable commodity, so to speak, of which any really highly civilized community may avail itself.

The Christian religion is regarded as one of the principal foundation stones of good government, as we all know. Nevertheless, many people use the cloak

of religion to cover up many things, both knowingly and unknowingly, and make little or no attempt at the practical application of religious teaching to the affairs of every-day life. Religion is a comfort to many people in times of trial, tribulation and distress. It is perhaps well that such is the case. It becomes necessary, however, not to accept dogmatically all ancient-day religious teaching but to use knowledge, both scientific and general, judgment, and discretion in order to arrive at the foundation principles and a correct interpretation of the statements written in ancient biblical literature. The following incident illustrates quite well a common situation.

"We stand in the face of one of the great mysteries of life. A young life given just two years ago has now been taken away. We search for an explanation but find none. We know not the ways of the Lord. We know, however, that it must be for the best although we grieve to the extreme. 'The Lord giveth and the Lord taketh away,' said the minister as the little white casket was lowered into the flower-lined grave in the presence of sorrowing parents and a few relatives.

The circumstances were these: The child, a two-year-old baby girl, had died from diphtheria. A public funeral had been prohibited by the health department, in accordance with the regulations, much to the dissatisfaction of the parents, who seemingly possessed more than ordinary intelligence and standing in the community. The physician who saw the child two days before it died, stated that when he was called he found the baby completely prostrated, the pulse rapid, the face pale with the slight flush of fever over the upper part of the cheeks, all of which told of the extended invasion of the body with some infecting agent. An examination revealed a distinct membrane in the throat. The doctor took a swab for bacteriological examination, which was subsequently confirmed, but stated that without doubt the child had a very malignant case of diphtheria. He advised the immediate use of antitoxin and, notwithstanding the strenuous objection of the father, he gave 5,000 units of antitoxin, which was all he had with him. The parents were individuals who did not believe in the use of drugs or other therapeutic agents in the treatment of disease. They did not believe in vaccination or the use of antitoxin principally because, as they said, the biological products used were made from animals and that such substances would undoubtedly injure the human body. The doctor stated that if the child was to be saved the dose must be doubled within a few hours. The parents refused to allow the further use of this well established remedy, and gave as their opinion that the child was only suffering from a sore throat which would undoubtedly be relieved by morning. The doctor was dismissed and the father paid him for the services rendered. The baby died the following day, the physician in the meantime having reported the case to the health department which placed an immediate quarantine on the premises. Gross ignorance of the parents was the cause of this death. Is it not sacrilegious to charge the Almighty with responsibility in such a case? The parents were nothing more than plain murderers, perhaps because of ignorance, but this constitutes no valid excuse. It can be almost positively stated that if antitoxin had been used early and in large doses the child would have lived. The efficacy of this remedy has been thoroughly established. How often unnecessary deaths occur among infants which may be traced to ignorance, poverty and neglect. Morbidity tables show that 27.53 per cent. of all deaths occur under five years of age. There must be some reason!

It has been stated that almost anything can be proven by figures and statistics. This is not necessarily the case, for figures are nothing but the evidence on which certain conclusions must be based and certain statistical formulas deduced. It is, of course, obvious that if the figures in regard to births and deaths and morbidity are false that the conclusions deduced therefrom may be erroneous. It is true, however, and as has been pointed out by one of our noted statistical authorities, such a situation exists in connection with the weighing of all evidence and such statements do not apply necessarily alone to vital statistical figures. It is quite evident, therefore, that in public health work it is very necessary to have accurate figures as to the occurrence of births, deaths and sickness. The situation in this country today is not altogether satisfactory. Approximately 65 per cent. of the population of the United States is represented in the registration areas of the Bureau of the Census. In most of these registration areas accurate figures are at hand showing the number of deaths and their causes. In very few of these registration areas are complete birth returns secured and in none of these registration areas are complete returns secured in regard to morbidity or sickness. In Ohio practically all the mortality or death returns are secured, but only 50 per cent. of the births and 70 per cent. of the cases of sickness. It is necessary, therefore, in certain instances to make carefully compiled estimates based upon the character of the population and the habits and methods of living of the people. All public health workers agree that one of the fundamental propositions in carefully administered public health work is the securing of accurate vital statistics. Disease cannot be adequately controlled unless an exact knowledge of the location of the disease is at hand. By this means, also, the various health agencies may check the effectiveness of their work. There seems to be no question but that the public must be educated as to the value of vital statistics in public health work, and along with their value in this line of work must also be mentioned their legal value, which is by no means an unimportant feature.

A life table prepared by the New York City health department, and based on the inhabitants of New York City, is exceedingly interesting. It is a study of the statistics for the three years, 1909-1911. In 1882 Dr. John S. Billings prepared a somewhat similar table for the United States Bureau of Census. The years covered in Dr. Billings' table were 1879 to 1881, a three-year period. The two tables are just thirty years apart and comparisons are therefore instructive.

A child under five years of age thirty years ago had a life expectancy of forty-one years, and at the present time the expectancy of such a child is shown to be fifty-two years. There has been, therefore, an increase in life expectancy of approximately eleven years. According to the last compiled table the expectancy decreases quite rapidly for every five-year period after the five-year age period until we find that adults from the age of twenty-five to thirty years have at present an expectancy of life of 34.3 years, and thirty years ago such adults had an expectancy of 32.6 years. The increase in this case is only 1.7 years.

After the age of forty years one finds that the expectancy of life is less now than it was thirty years ago. The recently formulated table shows that adults (40-45 years) have at the present time an expectancy of 23.4 years, where thirty years ago the expectancy at these ages was 23.9 years. There is

therefore, a decrease in expectancy of six months. This decrease in expectancy continues after forty-five years of age but is not particularly great as shown by the fact that the expectancy at eighty-five years of age at the present time is only three years and three months less than it was in 1879-1880. The question naturally arises as to the cause of this decrease in expectancy of life after the forty-fifth year as shown in comparing the two tables. This can be ascribed to the greater prevalence of diseases of the heart and kidneys, particularly those due to organic changes in the circulatory apparatus and to the increase in cancer and the so-called degenerative diseases. It has been stated also that more spirituous liquors are consumed in the present day and that our diet is more largely nitrogenous than it was years ago, thus causing more extensive degenerative changes. It is also claimed that the hurry and worry of our modern existence, coupled with the fact that we do not take sufficient exercise or eat and thoroughly digest enough good food, is also partly responsible.

The expectancy among females is shown to be greater than among males up to forty years of age and thereafter the expectancy is less.

In summarizing it may be said that at the age of forty more people are now living in comparison with the number born than thirty years ago. However, after the fortieth to forty-fifth year the expectancy is decreasing, and in proportion to the number born there are fewer people now than thirty years ago.

Careful studies have been made indicating the preventability of many diseases. These estimates are without doubt extremely conservative. Carefully prepared tables show, for example, tuberculosis as 75 per cent. preventable, typhoid fever as 85 per cent. preventable, pneumonia as 45 per cent. preventable, and diphtheria as 70 per cent. preventable. There are also some diseases, such as cancer, which at the present time would have to be stated in such a table as being zero preventable, or nonpreventable, while in this particular case we know that there is a certain degree of preventability if attention is given to certain matters early enough in life. Ratios of preventability having been determined for many diseases, it is not difficult to estimate the extension which is possible in the average human life by the saving of lives now lost from preventable causes. As previously indicated, every individual has a definite life expectancy at certain age periods. In making calculations as to the extension of human life it is necessary, of course, to base such calculations on the assumption that if an individual be saved from death from a preventable disease he or she will live to the full limit of expectancy, as indicated at the particular age period. In other words, as some one has expressed it, the individual gains a "new lease on life." It becomes a question, therefore, of postponability of death until at least the limit of normal life expectancy.

It can be easily appreciated that all through life factors operate which may improve living conditions and extend the life expectancy. Consequently any estimates of postponability of death at a definite age period would be extremely conservative on account of the good factors, above referred to, which might operate to prolong the life of the individual. It has been estimated, therefore, on these very conservative grounds that at least eight years could be added to the average human life by merely providing, or supplying conditions which would insure for the individual pure air, water and good food at all times. It is estimated that if preventable diphtheria were eliminated as one of the health

hazards, at least a half year could be added to the average human life; seven months could be added by the elimination of preventable typhoid fever; two years by the elimination of preventable tuberculosis, and almost a year by the elimination of preventable accidents.

At least half of the deaths which occur among infants under one year of age are preventable. One-half of the diseases and deaths of childhood, one-third of the diseases and deaths of middle life, and one-fourth of the diseases and deaths of later life are absolutely preventable and postponable. While it is true that investigators have somewhat different ideas as to the percentage of preventability of the various diseases it can be conservatively stated that all agree that at least 33 per cent. of all deaths which now occur could be prevented or at least postponed.

Some economists have attempted to work out a satisfactory basis for determining the value of a particular individual to the community. The most satisfactory conclusion which has been reached is that *a person is worth to the community the difference between his or her earning power and the individual's cost of maintenance, which sum represents 6 per cent. of the total value.* For example, a mechanic earning \$840 a year spends on the average \$540 for maintenance. The difference between maintenance and amount earned in this instance is \$300. Three hundred dollars is 6 per cent. of \$5,000, which would, therefore, be regarded as the value of that particular mechanic to the community. In a similar way the value of any business or professional man may be estimated. It should be borne in mind, however, that there are certain variable factors, such as age and physical condition, which must be considered, the same as when rating the value of other breeds of livestock. Such computations must include also a consideration of life expectancy at certain age periods. It has been shown, therefore, that the value of a new born babe, based on its life expectancy, is very low, being about \$90 to \$100. A child must be regarded as a distinct liability to the community until such time as it reaches an age when it can by its own labor support itself and pay for the cost of maintenance. This age is supposed to be between ten and twelve years, after which the child becomes an asset to the community because of his or her ability to produce more than the cost of maintenance, which difference can be figured, as above mentioned, on a basis of being 6 per cent. of the total value. All computations on this basis, as previously stated, include the factor of life expectancy. Thus we find that the maximum value of laboring men, including mechanics and business and professional men, is reached at from twenty-five to thirty years. It is quite true that the productiveness of the individual after this time may be greater than before, but the life expectancy is decreased from year to year after this period. Later on all working people reach an age when they cannot labor and at such time they become a liability again to the community. Thus at the age of seventy to eighty the average individual is worth about the same amount as he or she was at birth, and after this time the liability to the community may be estimated in dollars and cents just the same as assets were estimated in the earlier period of life. It is obviously necessary, therefore, for all individuals to save a certain amount of the funds during their most productive periods and to use all possible means to increase their life expectancy to the full limit. They should create, as some one has suggested, a sinking fund, which will maintain them after the time when they become a liability to the community.

According to the U. S. Bureau of the Census the death rate in the registration area of the United States during 1913 (the last year in which complete statistics are available) was 14.1 per 1,000 estimated population. In 1912 it was 13.9, and in 1911 14.2, and the average from 1906 to 1910 was 15.5 and from 1901 to 1905 was 16.2 per 1,000. During the years 1911, 1912 and 1913 the average was 14.06 per 1,000 estimated population. What does this reduction in the death rate mean in the actual lives saved? The reduction in the death rate from 16.2, the average from 1901 to 1905, to 14.1, the average of 1913, amounts to 13 per cent., or a reduction of one death in every eight. If the same rate had prevailed in 1913, as in the period from 1901 to 1905, there would have been recorded, according to Hoffman, at least 1,025,446 deaths instead of 890,823, and in this instance there is a saving of 134,623 lives.

The largest percentage of decrease in deaths in the various states was shown in Rhode Island (15.7%), followed by New York (12.3%), New Jersey (11.2%) and Massachusetts (9.6%). It is probably only a coincidence that all these marked decreases occurred in one section of the country. In certain states increases in the death rate were noted as, for example, Michigan (4.5%), New Hampshire (3.0%), and Indiana (0.8%) per 1,000 population. It is probable that these increases are due to the more accurate registration of deaths in these states and not to actual increase in rates. The state of Washington had during 1913 the lowest death rate, 8.5 per 1,000; Minnesota had a death rate of 10.4 per 1,000; Utah 11 per 1,000; Wisconsin and Colorado 11.5 per 1,000; and Ohio 13.7 per 1,000 population. It will be noted that the death rate in Ohio for 1913 was somewhat less than the average (14.1 per 1,000). The highest death rates in the United States are noted in the following states: New Hampshire (17.1), North Carolina (16.8), Maryland (16.2), Vermont (15.8), Maine (15.3), and Connecticut, Massachusetts, New York and Rhode Island (15.) per 1,000 estimated population.

In the four states in the registration area which have a colored population of over 10 per cent., namely, Kentucky, Maryland, North Carolina and Virginia, the average death rate is 15.0 per 1,000, while in Wisconsin, Washington, Vermont and Minnesota, which have an equal population to the southern states, above mentioned, but have a very small amount of colored population, the death rate averages 11.5 per 1,000 population.

Among the cities in United States over 100,000 population, the lowest death rates are noted in Seattle and Spokane, Washington, the death rates being 8.4 per 1,000 in the former and 8.9 per 1,000 in the latter. Portland, Oregon, also had a low death rate of 9.5 per 1,000. The highest death rates in United States in cities of over 100,000 population were as follows: Memphis, Tenn., 20.8 per 1,000; Richmond, Va., 20.4 per 1,000; New Orleans, La., 19.9 per 1,000; Albany, N. Y., 19.8 per 1,000; Baltimore, Md., 18.5 per 1,000; Nashville, Tenn., 17.8 per 1,000; Birmingham, Ala., 17.4 per 1,000; Atlanta, Ga., 17.4 per 1,000, and Washington, D C., 17.3 per 1,000, estimated population.

It can be definitely stated that the low death rate in the cities of the northwest is due to location, climate, age and character of the population, and public interest in hygiene and sanitary science.

That much may be accomplished in those communities which pay attention to matters of public health is well illustrated by the typhoid fever death rates in certain cities of the United States having over 100,000 population. For

example, among the eight cities in the United States of over 500,000 population, the following death rates for typhoid fever are the most interesting

	1906-1910	1911-1913
New York	13.8	9.3
Boston	10.0	8.6
Chicago	15.5	9.6
Cleveland	16.5	11.4
Philadelphia	42.1	14.1
St. Louis	16.1	14.2
Pittsburg	74.3	18.5
Baltimore	34.6	24.9

The typhoid fever death rate in the city of New York for the year 1913 was 7 per 100,000 population, notwithstanding the fact that there was a milk-borne epidemic during this year. This was the lowest typhoid fever death rate ever experienced by the city of New York. An epidemic of typhoid fever also occurred in the city of Philadelphia during 1913 in that portion of the city supplied by the Torresdale filters. It was noted in this instance, for example, that the filtered water was pure but that certain industrial connections had been made and that the polluted water of the Delaware River was used by many plants along with the public supply, eventually becoming mixed with the public supply and thereby polluting the water mains. During 1913 the death rate in Cleveland from typhoid fever was 13.5 as against 5.9 per 100,000 population in 1912. The water supply for Cleveland is obtained from Lake Erie and hypochlorite of lime is used in treating this supply. At the present time Cleveland is installing under the direction of the State Board of Health an extensive system of water filtration plants. There was also an increase in the typhoid fever death rate in Chicago during 1913, due to the pollution of the water supply. The annual saving of lives to the city of Pittsburgh since the introduction of the filtration plants has been about 400.

In the group of cities in this country with a population of 300,000 to 500,000 the following typhoid fever death rates obtain:

	1906-1910	1911-1913
Cincinnati	30.0	8.5
Newark, N. J.	14.6	8.4
Milwaukee	27.0	18.6
Minneapolis	32.2	11.8
Los Angeles	19.0	13.6
Buffalo	22.8	17.3
Washington, D. C.	36.9	19.5
San Francisco	27.3	15.5
New Orleans	35.6	20.5
Detroit	23.4	20.1

These cities as in the larger cities are arranged in the increasing order of their typhoid death rate for 1913. During this year Cincinnati had the lowest rate, namely, 6.4 per 100,000 population. Cincinnati has a most modern and efficient filtration plant which purifies the water of the Ohio River.

Among the group of cities in this country with a population over 200,000 and under 300,000 it is noted that Seattle had a typhoid death rate of 4.9 per 100,000, which is the lowest, and Indianapolis a rate of 24.5 per 100,000, which is the highest in this group.

Among that group of cities with a population of 125,000 to 200,000 the typhoid death rate was lowest in Scranton, Pennsylvania, being 6.4 per 100,000 population. The City of Toledo had the highest rate in this group, being 41.8 per 100,000. This was due principally to the extended use of shallow wells. The typhoid death rate in Columbus in 1913 was 19.03 per 100,000 population.

Among the cities having a population of 100,000 to 125,000 the lowest typhoid fever death rate was in Bridgeport, Connecticut, being 5.4 per 100,000, and the highest 36.1 per 100,000 in Nashville, Tennessee. Dayton, Ohio, belongs to this group of cities and the typhoid fever death rate in this city has remained stationary at 15.1 per 100,000 for several years.

It is a well known fact that typhoid fever is primarily a water-borne disease. It may be acquired, however, in other ways, namely, through infection of food supplies and contact with typhoid fever germ carriers. The normal typhoid fever death rate is estimated to be about 10.0 per 100,000 population. It will be noted that the rates in a considerable number of cities in this country are much below the so-called normal rate. It will also be noted that a considerable number of cities are above the normal rate but that their rates have been materially reduced in recent years. The fact stands out very prominently that in those cities which have given attention to the securing of a pure water supply, the rates have been materially reduced. Conversely, in other cities where sufficient attention has not been given to this important phase of sanitary science the rates have not been materially reduced.

In this connection reference should be made to the phenomenon which was pointed out by Mills and Reincke, and known now as the Mills-Reincke Phenomenon. These gentlemen showed that the typhoid fever death rate was not alone affected by the installation of a pure water supply in a community, but that the incidence of general diseases was materially reduced. Hazen, who has carefully studied the statistics collected in all parts of the world, has noted the fact that for every case of typhoid fever which is prevented when a pure water supply is installed, two other general diseases are also prevented. That is, the ration of reduction in general diseases as compared with typhoid fever is about two to one. This ratio is now known as Hazen's Theorem.

It can be accurately stated, based upon the statistics at hand, that the mortality from tuberculosis of the lungs has been materially decreased in the United States during the last thirty years, and that at least 200,000 lives have been saved in the last ten years. In 1900 the death rate from tuberculosis of the lungs in the United States was 180.5 per 100,000 population. This death rate was reduced to 139.7 per 100,000 population in 1910, and during the last four years, although not so complete statistics are at hand, it would seem to have been lowered still further.

It is interesting that the aggregate mortality from tuberculosis for the ten-year period (1900-1910) was, according to Hoffman, about 1,331,000. If the death rate which prevailed in 1900, namely, 180.5 per 100,000 population, had continued during the ten-year period following, approximately 200,000 more deaths would have occurred. It is not necessary to emphasize the value of the saving of these lives to the state and the nation. Furthermore, inasmuch as the average age of death from tuberculosis is 36.1 years for both men and women, it will be seen that the 200,000 individuals have been saved during the most productive period of their lives.

It is probable that fully 150,000 people are dying annually in this country from tuberculosis in all its forms. When one appreciates that in addition there are fully 1,500,000 persons suffering from this disease in the United States, the enormity of the problem is at once evident. The statistics for Ohio show about 7,000 deaths annually with about 35,000 estimated cases.

Again, when one considers that tuberculosis is a known preventable disease, and that the community as a whole is accordingly responsible for the preventable sickness and deaths which occur, the necessity of more concentrated and concerted action along preventive lines is emphasized in a very forceful manner.

The question naturally arises as to what causes may be ascribed the marked reduction in the mortality from this disease. A critical survey shows this to be due, without doubt, to the nation-wide preventive campaign against this disease. This campaign has been carried on by voluntary associations in this country for several years. Recently the state governments have taken up the matter. It is hoped that by concentrated work and effort, the death rate from tuberculosis in this state may be reduced to much below the point where it is at the present time, namely, 137.9 per 100,000 population. The reduction in the death rate from this disease has been about the same in Ohio as in the country over.

It is well to appreciate, however, that the reduction in the death rate from tuberculosis in this state, and in this nation, will not be as rapid as it has been during the last few years. This is true of all diseases. The death rate may be rapidly lowered to a certain point, and then progress is extremely slow, due to certain obstacles and obstructions which may be regarded as residual. In order to combat successfully this disease in the future, especial attention must be given to the separate treatment of incipient and advanced cases of tuberculosis. The incipient case must be cured, either at home in the fresh air or in a hospital, and the advanced case, which is beyond hope of cure, must be taken out of the community to a hospital for advanced cases so as not to be a focus of infection.

Many other examples may be given of the incidence of other infectious diseases in communities where attention is given to matters of hygiene and sanitation and where such attention is not given. In all instances it is possible to reduce the death rates to a so-called normal. It is presumed that the normal death rate for a particular disease does not indicate the limit of its preventability in any particular community, but indicates the average secured when taking into consideration conditions which obtain the country over and conditions over which the individual members of the community have little control.

The importance of industrial sanitation is becoming more fully realized in recent years. This field is mentioned as illustrative of certain special lines of work carried on by certain departments of health. Health departments are now actively taking up the proposition whereby health-hazardous diseases may be eliminated from our various industries and all the established laws of hygiene and sanitation may be made operative in the places where men and women are employed. Without doubt there are some deleterious influences which operate in the following of every trade and occupation. It is of importance to find out what these influences are and it is of still greater importance to eliminate them if we are to conserve and lengthen the lives of our working people. During the last two years a very extensive study of the industries of this state has been made by the State Board of Health. It is fair to say that employers of labor

are becoming more and more convinced that the highest efficiency may be obtained when their employes are provided with a highly sanitary place in which to work and when all disease hazards are eliminated.

As illustrative of still another line of endeavor along social welfare lines, the work among the blind and on the prevention of blindness may be cited. It is estimated that there are at east 300,000 blind people in the United States and it costs about \$15,000,000 a year to support them. There are about 5,000 blind persons in Ohio. Probably 75 per cent. of all blindness is due to two causes, namely, ophthalmia or inflammation of the eyes in the new born and neglect to the eyes during early school life. The first cause can be easily removed by the universal use of a prophylactic of silver or nitrate at birth. The second cause could be eliminated if an adequate system of physical supervision of school children was in operation in every school so that defects of eyesight could be detected early and cared for scientifically. Accidents also cause a certain percentage of blindness and these can be largely eliminated.

It is quite difficult to estimate the economical loss to the individual who is blind. It is still more difficult to estimate the economical loss to the community. In Ohio it costs approximately \$4,000 to educate a blind child. Much is being done through the medium of the Institution for the Blind and the Ohio Commission for the Blind to make this group of people useful to a limited degree at least.

There has been a marked increase in the population of the world during recent years. This has been plainly due to the fall in the death rate and the consequent lengthening of the average human life. It is estimated that the population of the world is about 1,750,000,000 and that the annual increase in its population is about 12,833,000. The rate of increase in this country in 1910 was 12.7 per 1,000. This is more than double the rate of increase in 1810. The death rate, for example, in the principal civilized countries has fallen from 29.09 per 1,000 for the five-year period from 1880 to 1885 to 19.26 per 1,000 for the five-year period from 1905 to 1910. When one analyzes the available statistics it is noted that the decline in the death rate has been almost entirely in the age periods under thirty-five. From thirty-five to fifty-five years of age the death rate has remained about stationary and above fifty-five years of age it has increased. It is very evident that the cause of the decline in the death rate has been due to progress in bacteriology, hygiene and sanitary science. For example, the typhoid fever death rate in this country has been reduced from 35.9 per 100,000 in 1910 to 16.5 per 100,000 in 1912. There has also been a decline in the birth rate, particularly among that portion of the population which may be regarded as thrifty. This is true the world over. For example, in France the birth rate has fallen from 23.9 per 1,000 in 1886 to 18.7 per 1,000 in 1911. During the same period the birth rate in Australia fell from 35.4 per 1,000 to 27.2 per 1,000 population. Owing to the inaccurate birth returns in this country, it is impossible to give accurate figures, but it has been estimated after careful investigation that the decline has been practically the same as in France and Australia. It should be mentioned in this connection that economists consider it desirable for a country to have a low death rate and a low birth rate. Such a condition involves a minimum amount of waste of human energy and is really vital economy. Fisher, in this connection, refers to the fact that the female mackerel lays about 50,000 eggs and only two or three on the average

live to produce. This is a waste of energy and not economical. The higher the form of animal the less there is of this kind of waste.

Hoffman, writing on this subject, states that it is his belief that the population will increase still more rapidly in the future and that the general death rate will be lowered still further. He directs attention to the importance of conserving the food supply under these circumstances. He makes the statement, which is undoubtedly correct, that the production of cereal crops has increased more rapidly than the population. For example, the world's crop of wheat, rye, barley, corn and oats showed a 45 per cent. increase from 1895 to 1912, while the population increase in this period was only 12.6 per cent. Hoffman directs particular attention to the vital importance of conserving the food producing resources of the land and sea. He emphasizes the necessity of studying improved methods of food production in order to prevent waste and also the necessity of education in practical domestic economy. He thinks it is necessary to establish improved methods of general education, including adequate systems of medical supervision and physical training of school children. The control of marriage, fecundity, and divorce are essential. Attention is also called to the absolute necessity of improving the administrative control of public health matters and to the establishment of higher educational ideas, as well as the development of the spirit of social service. It is well known that the two greatest basic sources of economic wealth are the human race and the land with its soil, minerals and other resources. One cannot be conserved if at the same time the other is not conserved.

It is stated on reliable authority that in India, which is one of the most insanitary countries in the world, the average duration of life is twenty-three years for males and twenty-four years for females. This is, of course, less than half the average length of life in the more civilized countries of Europe and in the United States. Fisher, quoting Finkelburg, states that in Europe the length of human life has been doubled in 350 years. He states that reliable figures show that life is lengthening today much more rapidly than formerly. Studies of the life tables for early periods in England, France, Prussia, Denmark, and in certain other communities, show that during the seventeenth and eighteenth centuries human life was lengthened at the rate of four years during a century and during the first three-quarters of the nineteenth century had lengthened at a rate of nine years during a century. At present in Europe the rate is about 17 years per century, and in Prussia particularly the rate is 27 years per century. It is impossible to state exactly what the rate of increase is in this country. Such an estimate can only be based on the statistics collected in the state of Massachusetts; vital statistics having been collected in this state for many years. In Massachusetts the rate of increase at the present time is about 14 years per century. It will be noted that this is approximately one-half the rate of increase in Germany.

It having been established that human life may be lengthened by the observance of right and proper living, it is a pertinent question, therefore, to ask what is being done to conserve and lengthen the lives of our citizens of our commonwealth. This problem is of importance, as previously stated, not alone from the humanitarian side, but from the financial and economic as well. The total deaths in Ohio for 1913 were 68,399. Out of this number, as previously stated, a careful statistical study shows that 28,000 of these deaths were from diseases and accidents which are preventable. The preventable morbidity and

sickness was about 56,000 cases. If the average human life is worth \$1,700, and this estimate is exceedingly low, it can be estimated, therefore, that the economic loss to the state during the year 1913 was about \$47,600,000, and without doubt it was approximately the same for 1914, although statistics are not yet available. It is rather difficult to make an accurate estimate as to the cost of preventable morbidity or sickness. This involves a loss to the individual, a loss to the employer or business, and a loss to the state and nation. If this loss were on an average of \$1,000 for each case of sickness, which is also an exceedingly low estimate, it would mean that \$56,000,000 were lost to the state as a whole during the year. The total loss to the state, therefore, from preventable causes would total at least \$103,600,000 during 1913. This becomes a problem, therefore, worthy of very careful consideration. It should be a problem of grave concern to all our citizenship. Local, state and national public health agencies are established for the purpose of protecting our citizens against the ravages of disease. Obviously, the principal points of attack must be directed against preventable diseases.

There are in the state of Ohio about 2,200 health districts, composed of townships, villages and cities. The local health administration of these districts varies from that in which the highest order and efficiency is maintained to districts in which little or no attention is given to public health matters: the main work being the establishment of quarantine which may or may not be efficient and the performance of disinfection and fumigation. On the whole it may be said that the local health agencies of Ohio are not highly efficient. This is due to several causes, among which may be mentioned lack of interest on the part of the public in health matters, limitation in finances, and certain requirements in the law which make the efficient administration of the public health in the small districts required in this state almost impossible.

The state maintains a state department of health under the direction and supervision of the State Board of Health. This board is composed of seven members from various parts of the state, appointed by the Governor, and in addition the Attorney General of the state is a member ex-officio. This board meets on an average of once a month, and in the meantime delegates the majority of its powers and duties to the secretary and executive officer. The department itself is organized in seven different bureaus or divisions as follows:

A Division of Administration has supervision over all other divisions of the department and acts in an advisory capacity to all the local health departments as well as executes all the orders and regulations of the State Board of Health and enforces all the requirements of the state law.

A Division of Sanitary Engineering passes upon and has supervision over all the public water supplies, sewerage, and waste disposal plants and sewerage systems in the state.

A Division of Communicable Diseases has charge of the investigation of epidemics of disease and research as to the cause and means of prevention of disease.

A Division of Hygienic Laboratories has charge of the chemical and bacteriological examinations of water supplies and other materials, as well as the diagnostic work on suspected cases of typhoid fever, tuberculosis, diphtheria, rabies, and the like. A new function has just been added by a recent act of the Legislature, namely, the production of diphtheria antitoxin for distribution among the poor and indigent.

A Division of Public Health Education has charge of the general educational campaign on public health in the state. It has been firmly established, as previously referred to, that the remedy for practically all our public health problems rests in the education of the people. This division has during the last two years been conducting a public health exhibit, composed of charts, models, motion pictures, etc., which is shipped to various parts of the state and is on the road almost continuously. The essential part of the exhibit is the series of lectures which are given by the various members of the staff of the State Department of Health. Approximately 500,000 people have seen this exhibit and have heard the lectures given during the last two years. This division also issues a large amount of literature on public health topics which is distributed either directly to the people or to the local departments of health. The division also has charge of the public health nursing work carried on in the various communities of the state and the installing of new nurses for this work, tuberculosis, hospitals, dispensaries, and voluntary organizations doing anti-tuberculosis work.

A Division of Occupational Diseases and Industrial Hygiene has charge of the investigation of the occurrence of disease and sanitary conditions in connection with the various industries and places of employment in the state. During the last two years an extensive survey has been made of the industrial health hazards which are present in connection with the operation of the industries of Ohio. The places of employment of approximately 235,934 working people have been investigated. These individuals were employed in 1,040 industries. This is the most complete survey of its character that has been made in any state.

A Division of Domestic Sanitation and Plumbing Inspection has charge of the enforcement of the sanitary provisions of the Ohio State Building Code. It has been established that housing, including plumbing and drainage, has a very close relation to many phases of public health work.

A Division of Child Hygiene has been established and this division will deal with infant welfare work and the conservation of child life.

The problems with which the state is called upon to deal in public health work are many and varied. It is the aim of the State Department of Health to give intensive consideration to the more vital and most important of these problems, and the department is being supported in this work by a very large number of the local departments of health. The test of the efficiency of all public health work is the death rate. During the last twenty-five years the death rates in Ohio have been materially reduced. It is probable that the death rates will be also lowered during the next twenty-five years, inasmuch as all the forces are now allied against and are attacking certain of the fundamental and heretofore almost unsurmountable obstacles. It may take considerable time to overcome these residual obstacles, the main one of which is ignorance of methods of right living. It is necessary, therefore, that the public be thoroughly educated as to the preventability of disease. In all probability it will never be possible to eliminate all preventable disease but the occurrence of this group of diseases may be reduced to almost a negligible factor. Community health must be regarded as being fully as important as community prosperity. We must eventually reach a point where a community which has a high death and pays no attention to matters of hygiene and sanitation is to be looked upon as being in a semi-civilized state. Being in such a state, such a community becomes immediately the matter

of concern for all other communities in order to watch and adequately protect themselves.

Briefly stated the public health problems in Ohio which must receive attention if we are to conserve life and postpone death until the full limit of life expectancy are as follows:

1st. A reduction in the infant mortality must be brought about as 27.3 per cent of all deaths occur under the age of five years, and 19.3 per cent below the age of one year. Fifty infants die on the average each day in Ohio from preventable diseases. The improper feeding and housing are responsible for the largest per cent of infant deaths. The fundamental factor is ignorance on the part of the parents as to the scientific methods of rearing their children. Legislation is necessary in many communities in order to provide for sanitary housing and the elimination of overcrowding, bad ventilation, etc.

2nd. Attention must be directed to conserving the lives of our school children. Adequate systems of physical supervision should be installed in our schools. By this means the occurrence of communicable disease could be detected at an early period. Any physical defects found should be corrected in early life in order that the subsequent career of the child may be favorably modified. At least 70 to 75 per cent of all our school children are defective. The subject of hygiene must be taught with more emphasis, the value of pure air, sunlight, good food, and exercise receiving more extended consideration.

3rd. Tuberculosis, which kills approximately 7,000 annually in this state, and of which there are at least 35,000 cases, must be eliminated as well as the other communicable diseases. The value of fresh air, good food, sunlight, and proper and legitimate medication must be emphasized. Well recognized means are now at hand for the prevention of typhoid fever and smallpox through the means of vaccination. The public must be thoroughly informed as to the efficacy of these measures. The so-called contagious diseases must be adequately controlled by means of quarantine and isolation. Research must be carried on to determine the causes and exact means of transmission of many of our communicable diseases and new and adequate methods for their control must be worked out on the scientific facts at hand.

4th. Increased attention must be given to the elimination of health hazards occurring in connection with the operation of our industries. The lives of all the working classes must be carefully protected. The relation of disease to particular industries must receive careful study and if objectionable conditions are found these must be eliminated. Intensive consideration must be given the general subject of industrial sanitation.

5th. An absolutely pure water supply must be insured for every community in order that the incidence of water-borne disease and all other disease may be reduced. It has been established, as previously indicated, that the introduction of a pure water supply into a community causes a reduction of two general diseases to one water-borne disease. The work of providing a pure water supply for all our citizens is now being carried on with all possible vigor. It is estimated that by 1920 fully half the population of this state will be supplied by water of known sanitary quality.

6th. The food supplies of all communities must be adequately protected. While it is true that a large number of communities in this state have adequate food inspection services, it is also true that the majority of the citizens of our commonwealth are not protected at all in this particular. Food supplies which

cannot be sold in communities where there is active inspection are shipped to other communities which have no means of protecting themselves.

7th. Proper means must be provided for the sanitary disposal of sewage and all wastes. Every individual and every community should be held responsible for the proper disposal of all waste materials in order that these materials may not constitute a nuisance detrimental to the public health of the immediate community or cause nuisances or disease in neighboring communities. The time was reached some years ago when it became very evident that the streams in certain sections of this state must be used for sources of water supply. It is evident, therefore, that careful consideration must be given to the means and methods of preventing the unnecessary pollution of these streams.

8th. It is very evident that the problem of rural sanitation in this state is a very important one. Sanitary conditions in the rural districts cannot be regarded as entirely satisfactory. Typhoid fever and many other diseases occur more commonly in the rural districts than they do in the urban districts. Proper means of protection are not provided to carefully prevent contamination of the water, the milk, and other food supplies, and little attention is given the fundamental principles of sanitary housing.

These are only a few of the matters which should receive consideration in this state if we are to prevent the development of preventable diseases and adequately protect the lives of our citizens.

There is no question but that the public health movement has and is rendering a distinct service to the human race. The average length of life in this country has increased about seven years during the past fifty years. In Europe the increase has been greater. At the present time the length of human life is increasing at a rate of sixteen to seventeen years per century. It has been noted with regret that at the same time there has been a marked depreciation in racial vitality and stamina. As previously stated, the increased average longevity is due to the suppression of disease in those individuals below the age of thirty-five. Public sanitation has failed to accomplish a reduction in the mortality from chronic diseases which occur after the ages of thirty-five to fifty-five. The death rates are increasing after the years of fifty-five, as previously stated. Along with the great increase in population there has been developed an increasing proportion of defectives. It is quite evident that something definite must be done and intensive consideration must be given to ways and means of decreasing the incidence of disease in later periods of life and of curbing the development of defectives. It is probable that the remedy for the last named situation rests in a thorough understanding of the principles of heredity and eugenics which will substantially support legislation, bringing about the regulation of marriage and the segregation and sterilization of mental defectives.

It is well stated that one of the greatest assets in the modern public health movement is public confidence. All public health legislation should have for its purpose the introduction of methods and procedures of established importance and value. In certain instances the public has approved legislation along public health lines of doubtful value and not based upon sound scientific investigation or experience. Enthusiasts have occasionally made claims and promises that could not be substantiated. It is of absolute importance that nothing be recommended about which there is any question. Practical politics should have no place in public health work. Some one has made a very true statement that politics and sanitation will not mix and the compound produced thereby is

exceedingly dangerous to the public welfare. The public confidence must be preserved and co-operation sought at every turn in order to carry out the most modern and established procedure which will operate to prevent the occurrence of disease and to lengthen human life.

THE COLLECTION AND VALUE OF MORBIDITY STATISTICS.*

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In February of this year a new system of morbidity reports was put into operation in Ohio. The old system of semi-monthly reports was discarded, and physicians were instructed to make a separate written report of each case of notifiable disease to the health officer having jurisdiction. The health officer was instructed to make use of these reports and then forward them to the State Department of Health. In the place of the semi-monthly report the health officer was directed to make a summary report at the end of each month. This new system follows the recommendations of the leading sanitarians of America as embodied in the Model State Law for Morbidity Reports and is not only a state matter, but is an integral part of the morbidity report system of the United States Public Health Service. It was realized that difficulties would be encountered in attempting to obtain more detailed reports, but the need was so keenly felt that it was decided to face these problems at once, relying on the intelligent co-operation of the 2,100 Ohio health officers, and the 8,000 Ohio physicians. After five months of trial the State Health Department feels that the step taken has been justified by the results. The ideal of complete reports of all notifiable diseases is still far from realization, but from the first the monthly summary report alone has proved much more valuable than the old semi-monthly report, and in addition the health officers and the State Epidemiologist have had advantages of the use of 15,000 detailed case reports which would not have been made under the old system.

The reporting system was fully discussed in the November Monthly Bulletin and in February a letter of instruction was sent to each health officer. The reports, however, indicate that the system is not yet clear to all health officers in some of its details, and it is my hope that I may be able in this paper to remove some misunderstandings which exist.

First, as to the purpose of asking for written reports. These reports are primarily for the use of the local health officer, and there is very little information given on one of these report cards of which the progressive health officer should not make good use. Secondly, these reports are of real value to the State Epidemiologist in tracing the courses of epidemics and for making statistical studies with a view to determining the causes of disease outbreaks and the most effective means of disease prevention. These written reports are obviously the most important part of the reporting system. Uniform blanks for making

* Read at Conference of Health Officers.

these reports are supplied direct to physicians or if the health officer prefers they are sent to him for distribution to physicians. The health officer should see that all physicians practicing in his district are supplied with these blanks and must insist that every case of notifiable disease attended by a physician is reported in the proper form. Where immediate action is necessary the physician should of course notify the health officer in the most expeditious manner possible, but if this report is verbal or by telephone he must follow this report by the regular written report, so that the health officer may have a basis for an official record. The physician who is also a health officer must also keep a record and report cases in his own practice in the regular form to the State Board of Health.

On receiving one of these reports the health officer should inspect it carefully and see that all necessary blanks are correctly filled. He should then take whatever action the nature of the disease requires. Particular care should be taken to investigate the source of the outbreak in order to prevent additional cases from the same focus. The health officer should look even beyond his own district and establish reciprocal relations with other health officers for the purpose of preventing the spread of disease from one health district to another.

After the health officer has done everything in his power to protect the community, he should make a record of the case, either in a book or on another card, leaving space for a further entry noting the recovery or death of the patient. At the time of making this record the health officer should fill in the blanks on the address side of the report blank. The number of the health district will be found on the monthly summary card. It is important to enter this number on each card, as many cards are incompletely or incorrectly filled in by the physician, and it is often difficult at the state office to locate a case in its proper health district. This precaution is particularly important where a health officer serves both a village and a township. In such a case he should be careful to make it clear from the number whether the case is in the village or in the township outside the village. The second blank space is to be filled in only when the report is of a suspected case. When the diagnosis is uncertain the card should be held until definite information is obtainable. If the diagnosis is confirmed, write "yes" in the second space, if otherwise write "no". Exception to this rule should be made in case the assistance of a state inspector is desired. In such a case the report cards should be forwarded at the time the request for an inspection is made, without waiting for a confirmation of the diagnosis. The third question need only be answered in districts served by a public health nurse. The State Board of Health supplies literature giving instruction in regard to certain diseases, such as tuberculosis, diphtheria, scarlet fever, measles and smallpox. Every family in which one of these diseases occurs should be supplied with a copy of the appropriate leaflet or pamphlet, and the Board desires to know in each case whether this literature has been supplied. Under "Other measures taken" the health officer should state briefly what he has done to protect the community from the disease. If nothing is written in this space it is natural to assume that the health officer has done nothing but receive and transmit the physician's report. For quarantinable diseases the word "quarantined", if nothing else, should be written here.

On Monday of each week the original reports, except those held for more definite information should be mailed to the State Board of Health. The United States Public Health Service at first supplied franked envelopes for transmitting

these reports, but later the postal authorities ruled that these envelopes could not be used for this purpose without prepayment of postage. As the legislature has provided no state appropriation for this purpose it is necessary to require the local health boards to bear this expense. At the office of the State Board of Health, these cards are sorted, recorded and filed, and the information used for the guidance of the epidemiologists and for the reports to the Surgeon-General of the United States Public Health Service.

At the end of each month a double franked summary card supplied by the Public Health Service is mailed to each health officer. On receiving this card the health officer should detach the return card, and fill in from the records of the office the number of cases of each disease reported during the month just past. The blanks at the top and bottom of the card should then be filled and the card mailed. No postage stamp is required. If no cases have been reported during the month the report is extremely simple. No weekly report of "None" is required, and by actual timing it requires just twelve seconds to make a report of "None" on the monthly summary card. Yet there are still a few health officers with no cases to report who still neglect to make this report on time. It may be of interest to know that the relative efficiency of local health officers, even in the smaller communities, is a matter of frequent mention in the office of the State Board of Health, and that the first question asked is almost always "Does he report promptly?"

For the success of this or any other reporting system the co-operation of the physician is essential. The busy doctor often grumbles about the time necessary to make a written report and sometimes objects to paying postage on the report cards. But the physician is almost always a man of at least average intelligence, and there are very few in the profession who cannot be made to see the real value of a written report. This is especially true when the physician can see that the local health officer is making good use of the written report. There seems to be no way under present laws for the State Board of Health to pay this postage. Several cities, however, have found it extremely advantageous to pay this postage for the physicians, either by stamping the cards in advance or by making an arrangement with the postmaster by which the cards can be mailed without postage and the postage collected on delivery or from a deposit made at the postoffice. Some such arrangement could easily be made by smaller health districts and would involve very little expense. If the physician cannot be induced by purely peaceful methods to make proper reports, the health officer should not hesitate to prosecute in the court of a mayor or justice of the peace. Every prosecution so far instituted has been successful. It is only necessary to prove that the physician attended the case, knew it to be a case of notifiable disease and that he failed to report to the health officer.

Perhaps the hardest problem which health officers have to solve in this connection is how to obtain full reports of the so-called "kid diseases"—measles, german measles, whooping cough, chickenpox and mumps. These diseases are so constantly with us that most people regard them but lightly. If some new disease were to appear and destroy the lives of 600 children in Ohio in a year, the whole state would be aroused and unlimited funds would be available to fight the scourge. Yet measles and whooping cough each take this toll of child lives almost as regularly as the years pass, and Mrs. Jones still says that Johnnie and Sallie might as well have it and have it over with, and takes the poor little victims to see Willie and Mary Smith who are whooping themselves black in

the face. Not only do these two diseases take the sunshine out of 1,200 homes in Ohio each year by their direct ravages, but it is possible that the indirect effects may be still worse. The child on recovery is left weakened and predisposed to tuberculosis, pneumonia and many other diseases which may mar and shorten his life. Chickenpox is not so dangerous, but the fact that it is so often confused with smallpox makes it important to require that all cases be reported and quarantined. German measles also is frequently confused with scarlet fever and should be closely watched. Mumps is but rarely the direct cause of death, but the disease is often followed by very serious consequences, such as sexual sterility, deafness, heart disease, and nervous troubles. Then, all of these diseases seriously interfere with school work, and in the aggregate cause an enormous expense in loss of time, medical aid and nursing. There is no reason for permitting them to continue their ravages.

It should be sufficient to call attention to the suffering and death caused by the preventable diseases, but some persons are interested only in an argument in terms of dollars and cents, so it is well to remember that by the most conservative estimates, which cannot be disputed, preventable diseases cost the state of Ohio \$50,000,000 each year, or ten dollars for every man, woman and child. The average health district has a population of 2350, therefore, the average cost of preventable disease to a health district is \$23,500. It is your business to save to your health district as much of this expense as possible, and there is no question but that an efficient health officer will save to his community many times the amount of his salary and expenses.

We are all enlisted in the army of health, waging unceasing warfare against disease and death. We have equipment as much superior to that of sanitarians of the past as the means of destroying life in the European war are superior to the weapons of past wars. In the words of Pasteur "It is within the power of man to cause all infectious diseases to disappear from the earth". The great obstacle is ignorance; ignorance of the nature, causes and means of disease prevention on the part of the people, and ignorance of the presence of disease on the part of the health authorities. As health officer, you should be instructors in sanitation for your communities and you should also make use of your authority and insist upon full information in regard to every case of preventable disease.

THE RESPONSIBILITY OF THE HEALTH OFFICER IN CONTROLLING EPIDEMICS.*

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Section 1245 of the General Code very definitely states that these annual conferences are held to consider "the *cause and prevention* of dangerous communicable diseases and other measures to protect and improve public health."

At such a conference it seems to me that no topic could be more appropriate than a discussion of epidemics of these "dangerous communicable diseases". Since the health officer is one of the first men to be officially connected with

* Read before Conference of Health Officers.

an epidemic, it is my purpose to discuss both the health officer and some of his responsibilities in controlling an epidemic.

Who is the health officer of a given community? He is a man who has been selected to superintend the public health and general sanitary conditions of that district. He may be under the direction of a board of health or the township trustees, or he may serve instead of a board of health. In either instance he is given certain privileges and authority which are not given to any other official. He also has certain responsibilities, which to some persons seem very trivial, but in reality are very great, for an occasion may arise when the health officer is responsible for the lives and welfare of all the people in his district. When an emergency does arise and the health of the community is at stake, it is the health officer who must come to the rescue, for he is the only man who has the proper authority. At such a time the health officer is expected to act wisely and *quickly* before health is jeopardized or lives are lost. No doubt those of you who have been brought face to face with a real epidemic realize that a health officer has great responsibilities and that his pathway is not always flowery.

What kind of a man should be chosen to act as health officer? Would you desire *any* man who would accept the office and serve for the least money? If men are careful and cautious about choosing a *bank* in which to entrust and deposit their money, how much more cautious should they be in selecting a man to guard their health and the welfare of their community?

You will surely all agree that the health officer should be a man of at least average intelligence. That does not imply that he should be an educated man, or be familiar with the various diseases.

Physicians do not always make good officers, for sometimes they dislike to quarantine their good patients and occasionally they are not on friendly terms with the other physicians in the community. We occasionally find localities in which such conditions exist, and they greatly handicap proper health administration.

Even though he is not well educated, the health officer should be able to *write a legible letter* and express himself intelligently. Some of the letters received by our Department are quite puzzling and indicate the need of better informed health officers in some districts.

Discretion is another attribute which is necessary in the makeup of the successful health officer. He should be able to decide what to do and then do it without causing a great turmoil and unnecessary excitement in the neighborhood. In other words, he should know how to handle the people of his district.

In the third place, he should be a man who has the *welfare of the people at heart*. The man who seeks and obtains the office simply for the money it pays, very seldom makes a good health officer. Too often for various reasons the office is given to some incapable man, rather than to a public-spirited citizen who would use his authority for the benefit of the public. There are many health officers in the state who are very efficient and are doing very good work, but I am sorry to say that there are also many who do not seem to be doing *anything* and are even too negligent to return the monthly summary cards which are sent to them. Of course you think that the *salary of the health officer* is not sufficient for the amount of work involved, and that is often true, but you might also feel that some of these men were *over-paid* if you had them employed in your business.

What would *you* do if you heard there were a number of cases of small-pox in your district? Don't you think you would make an investigation and endeavor to stop the spread of the disease? I know of several instances in which the health officer did absolutely nothing until our department investigated and told him to "get busy."

Whenever you hear that a contagious disease prevails in your district it is your duty as the official guardian of the public health, to see that proper precautions to prevent subsequent cases have been taken. Therefore, I would say that the *first responsibility* of the health officer in dealing with epidemics is the *immediate investigation* of suspicious cases.

Perhaps your first information is only a rumor, and your investigation is necessary to establish facts.

The second procedure is to establish a diagnosis, which in some instances is not easy to do. If a physician has visited the patient, the health officer's task is easy, but if no diagnosis has been made it is often necessary to call in a physician. In other words, find out what the disease is and then proceed. Occasionally the disease is rather obscure and a dispute may arise in regard to the diagnosis, but it is always best to err on the side of safety rather than to spread a disease which may become epidemic. *Do not wait* until some physician calls your attention to the case, for as I have indicated, all cases are not under the care of physicians.

It is quite difficult, as you no doubt have found, to secure reports from physicians, but since that question is discussed in another paper I will simply mention that it is another of the responsibilities of the health officer.

The fourth and perhaps most important of all obligations for which the health officer is held accountable is the proper quarantine of cases. Right at this point is where so many men fail in their attempt to check an epidemic. They either do not quarantine or else do not enforce quarantine rules. How much good does it do to quarantine a family if they continue to come and go as they please? Impress upon all quarantined families that that card stands for certain rules and that you have the authority to see that these rules are enforced. Every case in an epidemic is important and it is impossible to check the disease as long as those affected are given their freedom. Many times a number of cases develop in a community before the proper officials begin to realize the gravity of the situation. Usually the neighbors begin to talk and demand that some action be taken. Then what is done? The health officer closes the school and perhaps the churches, and feels that he has done his duty. Quite often complaints come to our Department and if we ask why the cases were not quarantined, we sometimes receive this answer, "Well, I told them to stay in and they promised they would do so". Promises should not be accepted when human lives are at stake. *Put a card on the house and leave it there*, until all danger is passed. A health officer does not dare to show partiality. In the sight of the law a house in which a contagious disease exists should be quarantined, no matter if it is the residence of the mayor. Remember that this responsibility rests wholly with the health officer, and if he fails to do his duty, the public is not properly protected, because of an inefficient official.

Persons who are quarantined must be supplied with *food, fuel, water*, medical attention and nursing if necessary, and this constitutes another responsibility for our busy friend. Occasionally during the investigations of an

epidemic quarantined families complain bitterly, because of neglect along this line. After the card has been placed on the house the family is sometimes left to manage as well as they can or else break quarantine to secure food. You are obliged to care for them and do not expect them to respect your demands if you neglect your own duties.

The sixth responsibility is fumigation. All dwellings in which patients affected with scarlet fever, diphtheria, or smallpox have been kept, should be fumigated as soon as the attending physician directs. Fumigation should be done carefully and thoroughly in order that all infective material may be rendered inert. There are many methods of fumigation, some good and others worthless. Formaldehyde used in a generator or a combination of formaldehyde and permanganate of potash are the best agents to use to secure thorough fumigation.

If quarantine were released as soon as the home is properly fumigated, many new cases might develop after the card had been removed. To avoid this possibility the law requires that quarantine must be maintained for a certain number of days *after fumigation*, if there are other members of the family who are liable to develop the disease. The health officer is made responsible for this additional quarantine. No doubt you remember certain instances in which the quarantine card was removed too soon.

Thus you will see that in each individual case, the health officer has many responsibilities which cannot be assumed by anyone else. Of course many additional and sometimes very peculiar questions may arise and require additional effort. However, there is one point on which I wish to lay especial emphasis and that is the great advantage that is gained in controlling an epidemic by properly *isolating* all of the *first cases*. Keep them from infecting others. *It is your duty. The law demands it*, and the State Board of Health is always willing to aid you in your difficulties. Some of your neighbors and friends may grumble and complain, but they will also congratulate themselves on having a wide-awake health officer.

THE SYMPTOMS, DIAGNOSIS AND PREVENTION OF RABIES.

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Definition.

Rabies is an acute, contagious and in nearly all cases a fatal infectious disease, which is characterized by disturbed consciousness, increased irritability and later in the course of the disease, these symptoms are followed by a gradually increasing paralysis. The disease is transmitted from one animal to another, and from animal to man by means of wounds produced by biting. Man always contracts the disease from some lower animal, usually the dog.

Etiology.

The virus which produces rabies is of a protozoan origin and varies markedly in size. Some of the organisms are so small that they will pass through a moderately porous filter made from diatomaceous earth, while other bodies

may acquire twice the size of a red blood corpuscle. The virus has been shown to be present in the saliva five or six days before the appearance of symptoms.

Historical.

The disease has been known since the days of Aristotle, and an inherent fear of mad dogs has been developed. All sorts of explanations have been offered for its occurrence. Excessive heat during the summer months, hot feed, stagnant drinking water, violent nervous and sexual excitement have been deemed the exciting cause of the disease. Zink (in 1804), first determined the infectiousness of saliva by means of inoculation experiments.

Occurrence.

Rabies occurs in all parts of the world, and at all seasons of the year. The only exceptions are England and Australia where the disease has been successfully suppressed. It occurs in all mammalian animals. It is especially prevalent among wolves, foxes and dogs. Cats are infected perhaps more commonly than it is generally supposed. The disease is more prevalent during the summer months due to the fact that dogs are allowed more freedom during warm weather. Cases of the disease occur frequently during the winter months as well. Whenever the disease develops in an animal or in man, recovery practically never occurs.

Pathogenesis.

The theory suggested by Douboiné in 1879 concerning the way the virus travels when it is introduced beneath the skin is still maintained and has been experimentally proven. Douboiné maintained that the virus travels along the course of the nerve trunks from the point of its entrance toward the central nervous system. Vestea and Zagari showed that after the injection of virus into a nerve in the hip of a rabbit the paralysis will first appear in the hind leg, and from there proceed forwards, while after the inoculation of the virus into a nerve in the foreleg, or under the meninges the reverse will be traversed. Nicholas has shown that if a nerve connecting an extremity with the spinal cord is severed, and later some virus is injected into the affected limb, the disease will not be produced. Should the spinal cord be cut through its entire breadth before an inoculation into a peripleural nerve, only the part connected with the infected nerves up to the place of division becomes virulent.

According to Roux and Hodges the virus moves in a centrifugal direction along the nerve tracts. Thus when the disease has a rapid course the virus will be contained only in the nerves connected with the place of infection, and in the cerebral and spinal tissues, but when the course is slow the virus after a time will disappear from the nerves of the infected extremity, and reappear in the nerves of the other side of the body, undoubtedly after having passed the involved segment of the spinal cord. It is in this way that the salivary glands become infected and from there that the infection reaches the saliva.

Period of Incubation and Symptoms.

The time that elapses between the date that the animal or person is bitten and the date that symptoms appear, is exceedingly variable. It depends upon the virulence of the virus, the part of the body that has been infected and the age of the animal. It is well known that bites about the head and neck are much more likely to produce the disease, and in a shorter period of time, than

bites further removed from the central nervous system. The symptoms generally develop in about two to eight weeks, but they may be deferred for several months, or one or two years. In dogs and hogs the symptoms generally develop in ten or twenty days; in cattle and horses the length of time is from one to three months.

It is generally observed that the symptoms develop more rapidly in young animals than in old ones.

Symptoms in Dogs.

The disease occurs in two forms, viz: "furious rabies" and "dumb rabies." Furious rabies occur whenever the virus involves the brain. Dumb rabies occur when the spinal cord alone is involved.

A very excellent description of the symptoms in various animals by Hutyra and Marek has been translated by Mohler and Eichhorn of the United States Bureau of Animal Industry, a synopsis of which will be followed in this paper.

At the initial stage of the disease the animals show a peculiar change in behavior which, particularly in house dogs with dumb rabies may be so inconspicuous that it is completely overlooked, and the owners associate with them as usual, without suspecting that they have the rabies. Most dogs become capricious; they are at times irritable and gloomy, and avoid all noise, hiding in dark places, under or behind furniture, in a dark corner of the room or in a stable.

They obey the call of their master very unwillingly but they jump and fawn on him even more markedly than usual. They are at times so friendly that their masters cannot believe that they are rabid.

In other cases they show marked uneasiness, scratch with their fore-feet, frequently change their place of rest, walk uneasily around in the yard or in the room, suddenly stopping, becoming attentive and without cause, barking and biting at the air, "so-called fly-catching." If resting on the ground they frequently become startled and attempt to catch imaginary flies, growling at the same time.

The animal is easily irritated and when teased becomes excited and snaps at a caressing hand or any other object or at their companions.

A strong light, sudden noise or a touch on the body causes them to become still more excitable. The pupils are dilated and this is an important diagnostic sign. Many dogs will bite or scratch at the place on their bodies where they have been bitten and received their infection.

The appetite becomes perverted, and the animals will not touch their favorite food, or let it drop after having it in their mouths. Later they will chew food and objects within their reach and swallow them if possible. All sorts of objects have been found in their stomachs after death. The act of swallowing is attended with great difficulty. They repeatedly seek water but can only swallow small amounts of it.

By this time salivation exists, symptoms of which become more and more marked.

The second stage develops in from one-half to three days, the symptoms increase to a violent rage. They will lick the earth furiously, and chew and swallow any objects they find. They want to get away from their usual quarters; if they are confined in a room, they will endeavor to make their escape; if chained they will try to break the chains. Once escaped, they will

wander aimlessly around, and sometimes cover long distances without resting, biting without cause any animal they chance to meet. If their attacks are resisted, they will fight furiously without barking, or scarcely emitting a sound. They will behave in an aggressive manner toward other animals, sheep, swine, cattle and horses, and bite many of them. They do not, as a rule, attack human beings unless irritated or excited by threats. An enraged animal will bite at anything that happens to be placed before him, even a red-hot iron, or a burning coal. The attacks of rage are interrupted by periods of depression, in which he will lie down exhausted and unconscious, breathing with difficulty. Soon he will rise, remain standing in one place with staring eyes, dilated pupils and a peculiar changed expression of the face indicating cunning and fright, and then the slightest cause will renew the attack. In this stage, as a rule, symptoms of paralysis of some of the nerves appear. Most conspicuous is the change in voice due to paralysis of the laryngeal nerves or muscles, which causes the bark to become hoarse and double, and accompanied by loud, long-drawn howls. This barking is so characteristic that a person accustomed to hearing it may suspect a dog of having rabies from that alone.

Swallowing becomes very difficult owing to progressive inflammation and later to the degeneration of the fourth and twelfth pairs of cranial nerves. Regular food is wholly rejected and the animal is able, at best, to swallow only small amounts of water. Therefore animals thus affected do not swallow food or water at all. Salivation increases owing to the increased production of saliva and also to the difficulty in swallowing.

The stage of irritation lasts three or four days, and is followed by the paralytic stage. The attacks of rage become less violent and also less frequent, but in the meantime symptoms of insensibility and dullness appear. The paralysis becomes more conspicuous and other parts of the body may also become paralyzed. In addition to total loss of voice and inability to swallow, an at first partial, and shortly a total, paralysis of the tongue, lower jaw and eyes develops. The mouth is kept open most, if not all of the time, the dry and livid tongue hangs out of the mouth paralyzed, and the saliva flows in long threads from the lips. Owing to the irregular position of the eyes the animal squints, the cornea is dull and lustreless and the pupils are dilated. The symptoms give the face a peculiar, cunning and troubled expression.

The tail becomes paralyzed and hangs down between the legs. In walking or running, the hind legs are dragged along the ground. Later they lie recumbent on the ground; and if urged to rise they will make a few fruitless efforts with the fore-legs. The animal becomes emaciated and usually dies in convulsions.

The described clinical picture of rabies in dogs is subject to considerable variation. The stages may be shorter, or more prolonged. The stage of irritation may be very short and only exhibit a few symptoms of excitement; then not infrequently, the melancholic stage is followed almost without interruption, by the symptoms of paralysis of the lower jaw and throat, and then by paralysis of the hind parts of the body.

This form of the disease is usually spoken of as dumb rabies. The patients are weak from the beginning and neither bark nor bite. The animals usually die in three or four days.

Cats.

Rabies in cats show the same symptoms as in dogs, but these animals, being of a less confiding nature, generally seek dark corners in the beginning of the disease and do not leave them, or they may show, by continuous mewing, a more aggressive behavior, and show a desire to escape. Then they attack both persons and animals, including dogs, which come in their way, jumping at their faces or biting their legs from behind, inflicting severe wounds with their teeth and claws. Later the voice becomes hoarse with a peculiar howling tone owing to paralysis of the vocal cords, and from two to four days after the appearance, paralysis of the hind parts appear.

Horses.

In horses there is often an increased sensitiveness at the site of infection. The animals gnaw at the site of the bite and rub it against objects. Their behavior is otherwise quiet. Horses, particularly if they have been bitten by a dog several weeks previously, arouse a reasonable suspicion of an approaching attack of rabies. The animals are easily frightened and become very restless. They change their position very frequently, paw with their feet, gnaw at the manger and at other objects near them, and show staring, restless eyes with dilated pupils. At times they draw their lips convulsively up and backward so that the teeth are visible, while foamy saliva runs from the corners of the mouth. Some horses attempt to bite other horses, human beings, and more do they attempt to bite and kick dogs. They also exhibit increased sexual desire. Then symptoms of paralysis appear, swallowing becomes difficult and liquids are returned from the mouth and nostrils. When neighing, a hoarseness of the voice is observed. Later the symptoms of excitement become less frequent and less severe, while indications of severe paralysis appear. The animals fall to the ground and usually die on the third or fourth day of the disease, in most cases with violent convulsions.

Cattle.

Cattle, usually so quiet and docile, begin to show restlessness and excitement. They remain standing at one place, at times drawing the upper lip backward, tearing up the earth with feet and horns, looking around with head high, the eyes wild or staring, and finally attacking the other animals of the herd and even human beings, but particularly dogs that happen to be near. Animals tied in a stable attempt to get loose from the chains, jump up suddenly from their resting place, shake their heads, rise on their hind legs, bite at and climb into the manger and run the head against the wall, sometimes with sufficient force to break the horns. The animal then becomes quiet for a time, twenty or thirty minutes, and then exhibits another violent outbreak. Later these outbreaks occur at longer intervals. The other symptoms resemble those of the other animals, namely, increased excitability, biting the place of the bite or the scar, hoarseness, rapid bellowing sometimes lasting for hours, salivation, gritting of the teeth, difficulty in swallowing, loss of appetite, bloating, drying up of milk, convulsions in some groups of muscles, particularly those of the neck, the head sometimes being turned to the side, increased sexual desire, rapid emaciation, exhaustion, accompanied by paralysis, until death intervenes on the third to sixth day of the illness.

In cases of dumb rabies, the symptoms of initiation are only slightly marked or entirely absent, and early paralysis of the hind extremities occurs,

which is accompanied by moderate bloating, difficulty in swallowing and constipation. They exhibit marked weakness on attempting to rise, breathe laboriously and discharge foamy saliva from the mouth. On standing they move stiffly, smell at food, but swallow nothing. If they attempt to drink liquids these are returned through the nostrils and mouth. They do, however, make constant movements of mastication. The next day they lie on their chests, or with their heads resting on their shoulders, and exhibit spasmodic movements of the diaphragm, and other groups of muscles. Death occurs in most instances at the end of the first week.

Sheep.

The symptoms of rabies in sheep are quite similar to those of other animals, except that the stage of irritation is often absent or of a brief duration. The sexual desire may be marked and the animal may, for a time, exhibit an aggressive attitude toward the other members of the herd and endeavor to escape over the fences or out of the barn. The disease usually lasts from three to five days and ends in paralysis.

Swine.

In swine the symptoms of irritation usually are present early in the cause of the disease. The animals run around in all directions, grunt hoarsely, root the litter and the earth, gnaw and rub at the site of the bite, then hide for awhile and either remain quiet or perhaps grunt while lying down. If they are aroused by a noise, or touched, they jump up and run aimlessly around, attacking other swine, their own young, other animals and even human beings. While rooting they swallow various substances, and saliva runs from the mouth in abundance. They seek water, but can only drink with difficulty.

Young pigs sometimes fall down while running around, kneel on their front legs, lay the neck on the ground and in this position push their bodies in a straight line twenty-five or thirty feet backward or move around in circles in this same position. The other symptoms are very similar to those in dogs. The animals succumb on the second to the fourth day after the appearance of paralysis.

Course and Prognosis of Rabies.

According to Nicholas, the disease lasts four to seven days; in some cases it lasts only three days, but in exceptional cases it may last eleven to thirteen days.

A case of rabies cannot be accurately described, as there is so much variation in the length and intensity of the various stages. The stage of irritation is almost entirely absent in the case of dumb rabies. Only a few cases of rabies have been reported that have not proved fatal.

In human beings, the period of incubation may be as short as thirteen days, it is usually from twenty to sixty days, and in exceptional cases, may be prolonged to ninety days.

The patient shows dejection, fever accompanied by itching and trembling in the parts bitten; soon respiratory troubles, uneasiness, difficulty in swallowing, aversion to liquids, abundant salivation, in general, reflex excitability, and in consequence attacks of delirium appear; later, paralysis of the muscles of the face, eyes and tongue, as well as the extremities and trunk, is observed.

In exceptional cases the disease develops from the beginning in the paralytic form.

In making a diagnosis of rabies, the former disposition of the animal must be taken into consideration. A changed disposition, followed by signs of irritation and later by paralysis, form a very characteristic picture of the disease. The jaw usually droops, the face assumes a peculiar cunning expression, and the pupils are dilated.

Prevention of Rabies.

1. All wounds inflicted by animals suspected of having rabies should be thoroughly cauterized by a competent physician or veterinarian.
2. Human beings that have been bitten by animals known to have rabies, should receive the Pasteur treatment.
3. The disease should be controlled by muzzling and quarantining dogs. In England the disease has entirely disappeared after rigid enforcement of this procedure.

In 1889 the authorities first began to enforce muzzling laws and within three years the disease had almost disappeared. Then the laws were relaxed due to the fact that people claimed that muzzling was not humane. During the next three years the disease increased with enormous rapidity, and in 1895 muzzling laws were again rigidly enforced, and the disease disappeared everywhere except in Wales, and here the laws were enforced in spite of the protests of the people. The disease was practically exterminated within two years and now no muzzles are necessary. All dogs entering England are required to spend six months in quarantine before they are allowed their freedom. It is very unfortunate that such a procedure has not been enforced in the United States.

UNITED STATES.		
Year.	Deaths Reported in Registration Area.	Deaths Computed. No. Reported in Entire Country.
1913	95	142
1912	74	101
1911	83	123

OHIO.	
1913	6

In 1914 the Laboratory reports of the State Board of Health show that at least 120 persons were bitten by animals that were afterward proved to be rabid. This does not include the cases that occurred in the large cities. Since January 1st, 1915, the laboratory records show that at least 75 persons have been bitten by animals that showed positive rabies on examination.

The following are some rules for the management of an animal suspected of having rabies:

1. Any dog that has bitten an animal or person should be secured alive if it can be safely done.
2. He should be securely penned up and kept under observation for a period of two weeks during which time he should be given proper care.

3. If the animal remains well during this time he may be justly considered not to have the rabies.

4. Should the dog become sick, consider the possibility of rabies and seek competent advice.

5. Should the dog die, disappear or be killed, act upon the assumption that the animal had rabies.

6. Should the dog die from sickness or be killed, remove the head, pack it carefully in ice and send it to the State Laboratory for examination providing the animal has bitten human beings. If the animal has bitten animals alone, pack and send head to the State Veterinarian.

The following sections from the statutes refer to the keeping of dogs and reimbursement of persons bitten by rabid animals:

SECTION 3633. (*Impounding animals.*) To regulate, restrain and prohibit the running at large within the corporation, of cattle, horses, swine, sheep, goats, geese, chickens and other fowls and animals, and to impound and hold them for the penalty imposed by any ordinance, and the cost and expense of the proceedings; to regulate or prohibit the running at large of dogs, and provide against injury and annoyance therefrom, and to authorize the disposition of them when running at large contrary to the provisions of any ordinance.

(Applies in incorporated villages.)

SECTION 5838. (*When dog may be killed; owner liable for damages.*) A dog that chases, worries, injures or kills a sheep, lamb, goat, kid, domestic fowl, domestic animal or person, can be killed at any time or place, and, if attempting to kill such a dog running at large a person wounds it, he shall not be liable to prosecution under the penal laws which punish cruelty to animals. The owner or harbinger of such dog shall be liable to a person damaged for the injury done.

SECTION 5839. (*When a dog is a nuisance.*) The court or justice before which the recovery is had for such an injury, shall declare such dog to be a common nuisance and order the defendant to kill it or cause it to be killed within twenty-four hours thereafter, or order a constable, marshal or sheriff to kill it.

SECTION 5851. (*Reimbursement of persons injured by a mad dog or other animal.*) A person injured or bitten by a dog, cat or other animals afflicted with rabies, if such injury has caused him to employ medical or surgical treatment or required the expenditure of money, within four months after such an injury and at a regular meeting of the county commissioners of the county where such injury was received, may present an itemized account of the expenses incurred and amount paid by him for medical and surgical attendance, verified by his own affidavit or that of his attending physician; or the administrator or executor of a deceased person may present such claim and make such affidavit. If the person so bitten or injured is a minor such affidavit may be made by his parents or guardian.

SECTION 5852. (*Duty of county commissioners.*) The county commissioners not later than the third regular meeting, after it is so presented, shall examine such account, and if found in whole or part correct and just, may order the payment thereof in whole or in part, out of the general fund of the county; but a person shall not receive for one injury a sum exceeding five hundred dollars.

A SURVEY OF INDUSTRIAL HEALTH-HAZARDS AND OCCUPATIONAL DISEASES IN OHIO.

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(Continued from the September issue.)

HOOKWORM DISEASE.

We have been unable to attack this problem at all, principally because of the long continued coal miners' strike. Coal mining is the most likely industry in the state with which it is associated. This subject, also, would require a rather intensive study, occupying at least several weeks, and requiring the time of two physicians from the office during most of that time.

Since the disease is very prevalent in Kentucky and West Virginia, there is hardly any question of its existence, at least in the southern counties of Ohio. There is some question, however, of its extent among coal miners or other workers in this State, since the methods and processes of mining are quite dissimilar to those carried on in Virginia, the principal difference being that all Ohio mines are slope or drift mines instead of shaft mines, and while there are a great many mines, none are individually very extensive.

The following is copied from the Annual Report of the Ohio State Board of Health for the year 1913, p. 718, and serves to show the existence of the disease in the State at a point about half-way between Cleveland and Columbus:

"On August 2, 1913, in compliance with the request of a physician, the epidemiologist visited Washington Township, Holmes County, to investigate some supposed cases of ankylostomiasis.

"His report follows:

"A physician from Loudonville found a number of persons in Washington Township, Holmes County, who were suffering from a low grade anemia. These patients had a staring expression, showed great weakness, pot belly and other symptoms suggestive of hookworm disease. The history of these cases showed that the first case had contracted the disease in Indiana, where he suffered from a pustular affection of the soles of the feet. About three months afterwards symptoms of his present illness developed. Shortly afterwards his wife and daughter contracted the disease.

"The house in which this family live is in an extremely insanitary condition. Sewage is disposed of in a privy which contaminates the surrounding soil. The avenues of infection are, therefore, open. An examination of these patients was made and revealed tenderness in the right iliac region besides the signs and symptoms before mentioned. Bloodsmears were taken from

these patients and examination of these revealed a considerable degree of anemia and an increase in the percentage of eosinophils. Specimens of stool were also taken and active parasites (*Necator Americanus*) and ova were found. The evidence is, therefore, complete that these patients are suffering from ankylostomiasis.

"The local authorities were advised of the presence of this disease and recommendations were made with a view to determining the presence of other cases, of controlling all known cases, and to place privies and cesspools in such condition that the infection could not be transmitted as at present. The patients were also instructed in the methods necessary to prevent them disseminating the disease. The physician was advised as to the proper treatment of such cases and he planned to begin thymol administration in accord with Stiles' method at once.

"These cases are of great interest as the first to be reported to the State Board of Health in Ohio."

ANTHRAX INFECTION.

During the year 1913 there were 3 cases of death reported to the Vital Statistics Department of the state in which anthrax was mentioned as a complication. Two further cases (not fatal) were called to our attention during 1914. A little investigation of these instances brought us to the conclusion that none were authentic, because two of them were associated with diabetes, and another with kidney disease. The subsequent histories of the two remaining, which were associated with the cutting of meat, and in which peculiar ulcers developed upon the thumbs, disproved their character as anthrax. Furthermore, we are informed by the authorities in charge of the Department of Animal Husbandry, at the Ohio State University, that no cases of anthrax have been reported among animals in the State in recent years. The experience of wool-sorters is given under that head.

TETANUS OR LOCK-JAW.

The occurrence of tetanus or lock-jaw is referred to under "Junk." There are a large number of industries and processes, also, having to do with the liability of getting dirt, horse manure, hairs from hides, etc., into punctured wounds or lacerations, in which workers are more liable to the germs of lock-jaw than ordinarily.

FURUNCULOSIS OR PUS INFECTION FROM OIL.

The following is taken from an investigator's report upon the National Acme Manufacturing Company, of Cleveland, Ohio, under date of September 26, 1913:

"Two years ago a rather extensive outbreak of furunculosis occurred among employees. One thousand gallons of lard oil is used per month in the

various cutting processes, and 50% of the employes have their hands and fore-arms constantly smeared with oil while working. The cause of the outbreak of furunculosis was traced to the oil, and a bacteriological examination made at that time showed the oil to be contaminated by a pur-forming organism. Oil sterilization department was then installed and careful inspection of at least 400 men today failed to show any evidence of furunculosis. Process is as follows: Oil is brought from all departments in buckets to several large centrifuges on the upper floor. Here it is centrifuged, the solid material being separated from oil itself. This solid material represents cuttings, etc. The oil flows by gravity from these separators to a collecting tank in basement. It then passes through a series of upright cylinders called 'settling tanks' and in this way an additional amount of sediment is allowed to settle to the bottom of tanks where it is drawn off as waste. From the last settling tank in series the oil passes to sterilizing tanks which are connected in multiple and which contain steam coils. From the last sterilizing tank the oil passes into storage and is undoubtedly free from germs. It is used again and again, fresh oil being added to make up for losses."

INDUSTRIAL APPENDICITIS.

While appendicitis is not a communicable disease it is so favored as to be communal in certain industries. Our attention was called to its frequency in many of the lead industries investigated, where the associated constipation and spasms of the intestines undoubtedly brought the attack on.

Appendicitis associated with constant reduplication of the self-same movements with the right foot and leg is illustrated by the series of cases mentioned under Factory Processes.

INDUSTRIAL TYPHOID FEVER.

Report of an Epidemic at Springfield, Ohio, in 1911.

"Twelve cases of typhoid fever attributed to untreated creek water were in the employ of the International Harvester Machinery Company. This company has two principal sources of water supply, one the city water, and the other untreated creek water. These two supplies are separated only by a valve in the main. The creek water is used only in cases of emergency, when the city supply fails as it has frequently done in the past. It is notorious that a double water supply such as is used by this company is a danger to those consuming it, if one of the sources is not free from contamination. A valve will leak, depending upon the relative pressures of the water on either side of it; and in this case the untreated creek water was always at a higher pressure than the city supply. The valve will also be opened occasionally in cases of emergency and the employes will not consider this but will continue using the water and so ingest bacilli received in the water from the discharging sewer. The use of such an arrangement has proven a fruitful source of infection in other places in the past.

"Another clue which rather pointed to the fact that the plant was responsible for the infection of the twelve cases ascribed to it, is the fact that the

disease among the employes occurred in the form of an epidemic, in October and the early part of November, pointing to a temporary infection of some vehicle used in common by the workmen. No other cause save the water was discovered in any case, and the evidence is very strong in favor of this mode of transmission."

INDUSTRIAL AND COMMUNAL TYPHOID FEVER.

"Report of an Outbreak of Typhoid Fever in the Quarry Districts at South Amherst, Ohio.

"On April 14, 1914, in compliance with the request of a physician, the epidemiologist visited South Amherst in Amherst Township, Lorain County, to investigate an outbreak of typhoid fever.

"His report follows:

"South Amherst is a small non-incorporated community built up around the quarries in Amherst Township. The population is probably about five hundred. A case of typhoid fever which was rather atypical developed in January. During the convalescence of this patient four other members of the family contracted the disease. From this family it spread to one of the neighbors and until up to the present time there have been twenty-two cases and two deaths among five families. In the first case those in attendance upon the child who had typhoid fever threw the discharges untreated upon the ground leading to the well. The wells in the village are, as a rule, quite accessible to the surface pollution of all kinds and the privies are so constructed that the soil surrounding them is contaminated for long distances. The limestone formation allows pollution to travel for long distances along the crevices without any oxidation or other purification.

"There are five cases of typhoid fever at the present time in one family. The cases were examined and found typical of moderately severe attacks of typhoid fever. One of the patients was in a hospital at Lorain and had had hemorrhages.

"The employes of the quarries are, as a rule, foreigners who do not understand the ordinary principles of cleanliness and sanitation. It is extremely difficult to instruct these people in the proper care of the sick so that disease will not be spread by personal contact. It would be an extremely difficult matter also, to place all wells and other sources of water supply in a sanitary condition and it would be even more difficult to enforce the construction of sanitary privies in all cases. It seemed advisable in the present situation to adopt a different procedure and to attempt to immunize as many persons in South Amherst as possible as the preliminary step. Toward this end, communications were directed to the officials of the two quarry companies in South Amherst requesting their co-operation in vaccinating their employes with anti-typhoid vaccine. It is recommended that this vaccine be supplied without charge by the State Board of Health and that the physicians employed by the two quarry companies administer the vaccine without charge to the men.

"When this preliminary step is taken, other precautions, such as placing the privies in a sanitary condition and rendering the wells safe from pollution, may be completed."

INDUSTRIES HAVING MISCELLANEOUS HAZARDS NOT INCLUDED UNDER PREVIOUS HEADINGS.

COAL MINING.

The U. S. Census (1910) gives the following figures for the coal mining industry in the State of Ohio:

No. of coal miners reporting to state.....	551
No. of superintendents, salesmen, clerks.....	980
No. of operators.....	44,056

The survey did not cover this industry for several reasons. The occupational diseases of coal-miners are of such a nature as to require an intensive study of each of them to draw any definite conclusions. It was considered best, therefore, to devote the time and funds at hand first to the manufacturing industries. When the time was opportune for the coal mining survey, the general strike closed all the mines for a long period. The influence of this upon occupational afflictions was and is such as not to warrant a survey until work has been continuously resumed for some months at least.

The principal occupational afflictions to which miners, in the types of mines which are worked in Ohio, are most liable are: respiratory diseases (pneumonia, anthracosis, pulmonary cirrhosis, emphysema, phthisis, pleurisy, and middle ear disease); hook worm disease; typhoid fever; trachoma or granulated eyelids; nystagmus or dancing pupils; "beat hand"; "miner's elbow"; while the effects of sulphur fumes upon the lungs, skin and eyes should be inquired into.

The Ohio Vital Statistics Reports for the years 1910, 1911 and 1912 give a total of 1,484 deaths among miners. Tuberculosis is the only disease which is specifically applied to these deaths. There were 114 deaths from pulmonary tuberculosis, or 7.68% of the total deaths. This compares very favorably for the rates among all occupations combined (13.3%) and also for Agriculturists (7.13%). This is in harmony with similar statistics for coal-miners the world over, i. e., that they have a low death rate from consumption itself, although respiratory diseases of other nature are excessive. In this connection it is well to point out that accidents and injuries claim 38.8% of Miners and Quarrymen in the registration area of the United States, and, as Dr. Wm. Ogle of England says, "A man who is killed by an accident cannot also die from phthisis or other disease."

Since coal mining is a long period occupation (that is, it is a trade which persons remain at presumably between the years of 15 and 60 or the entire work life) it is significant to point out that the average

age at death of 464 miners in Ohio, in the year 1911, was 49.3 years, or some 12 or 13 years less than the expected length of life.

BARBERING.

According to the Ohio Vital Statistics Reports for the years 1910, 1911 and 1912 there were 454 deaths among barbers; of these 105, or 23.12%, were due to pulmonary tuberculosis. This is considerably higher than the rate for all occupations combined (13.3%) and, particularly, Agriculturists (7.13%).

This trade was not included in the field work of the survey, but the most acceptable explanation for these rates is the indoor (often basement) confinement with long hours, breathing the breaths of patrons whom they lean over, and the breathing of fine hairs. Barbers also have skin troubles from the solutions which they use, and flat foot from prolonged standing (still).

CAISSON WORK.

Caisson work was carried on in a small way in the city of Cleveland during the course of the survey, in connection with the building of the city water tunnel where a total of 45 men were employed, and in connection with the city sewer where a total of 8 men were employed. The workers were divided into miners who were skilled men, muckers who removed the earth which had been dug out, and masons who bricked up after them, usually at night time. In both places the work was done under a pressure of from 15 to 20 pounds only, so that the hazard was not great. The men were required to come to the surface to use the toilets. When the pressure was brought to normal there was considerable condensation of moisture so that it became very chilly, especially for workers who had been perspiring. We quote below from the report of the Cleveland investigator:

"The construction work (of the water works tunnel) is supervised by Mr. _____ who has been engaged in the work all his life, and he said that it was his ambition to construct this tunnel without the loss of a single life. At the entrance of the tunnel they had a compressed air chamber, so that if a man feels the effect of his work under compressed air, he is brought in this chamber which is a tube 7 ft. in diameter and 10 ft. long, containing a cot. It is sealed at one end and has a door at the other. Here they can put a man under 18 pounds pressure. I had them put me in it and increase the pressure to this point, and felt some pain and roaring in my ears, but otherwise experienced no ill effects. It seems that if the pressure is increased or decreased gradually there is practically no ill effects and the amount of pressure the men work under depends upon the character of the soil they are

excavating, a soft ground needing more than a heavy clay or shale. To get to the site of the works one is carried through an old tunnel which is 7 ft. in diameter, on a small tramway for a couple of miles where they are building the 10 ft. tunnel. This tunnel is at present about 100 ft. long. To get into this part you are brought in a small chamber where the air is brought up to 15 pounds, and upon the man who operates depends largely the effects of the compressed air. If he is in a hurry as is very often the case, he will let you in or out accordingly before you are adjusted to the change.

"I saw one man out there who, 10 years ago, was working under 37 pounds and who was released in 1½ minutes, and he is partially paralyzed and uses two canes to get about. At the head of this tunnel is a crib (No. 2) and the men come up here to the toilet, which consists of some flat rocks abutting over the lake. The tunnel is 50 feet under the bed of the lake. All the men working there, with few exceptions, are experienced and have worked in several other places with Mr. ————. I questioned a number of them and several had had pains in their legs recently when changed too rapidly. A new man had had a slight attack a few days before. The tunnel is damp and chilly and I took a bad cold from my trip.

"I found that by chewing gum and swallowing, it was easier to become accustomed to the increase in pressure thus by inflating the ears."

RECAPITULATION OF INDUSTRIES INVESTIGATED.

Name of Industry.	No. Est.	No. Cities.	No. Males.	No. Females.	No. Wage-earn-ers.	No. Health-haz-ardous Proc-esses.*
<i>Poisons.</i>						
Agricultural Implements ...	12	6	4,499	61	4,560	9
Automobiles & Parts.....	34	10	17,404	379	17,783	18
Babbit Metal & Solder.....	2	2	8	.....	8	1
Bicycles, Sewing Machines.	3	3	2,685	110	2,795	12
Boxes, Fancy & Paper.....	4	4	351	230	581	7
Brass & Bronze Products...	55	6	4,450	82	4,532	16
Carriages, Wagons & Ma-terials	53	11	2,443	41	2,484	10
Cars Made By R. R.....	6	4	5,534	.....	5,534	11
Cars Not Made By R. R...	7	7	6,459	5	6,464	11
Cash Registers & Calculat-ing Machines	5	2	6,940	532	7,472	14
Chemicals	4	3	1,100	1	1,101	3
Coffins, Burial Cases, etc..	8	5	745	177	922	12
Copper, Tin & Sheet-Iron..	8	5	840	467	1,307	13
Cutlery & Tools.....	25	6	3,949	253	4,202	19
Dry Cleaning & Dyeing...	27	6	263	435	698	6
Electrical Apparatus	29	11	6,576	2,368	8,944	22
Electroplating	8	5	110	.....	110	5
Enameling and Japanning..	5	3	102	13	115	9
Engraving & Die-Sinking...	5	3	95	10	105	3
Explosives	7	7	755	239	994	6

* General Factory Processes not included.

RECAPITULATION OF INDUSTRIES INVESTIGATED — Continued.

Name of Industry.	No. Est.	No. Cities.	No. Males.	No. Females.	No. Wage-earners.	No. Health-hazardous Processes.*
Fertilizers	10	4	839	10	849	4
Files	4	3	108	.....	108	4
Flavoring Extracts	2	1	16	2	18	1
Foundry & Machine Shop Products	47	11	13,857	627	14,484	29
Fur Goods	4	3	21	23	44	1
Furniture & Refrigerators...	19	8	3,837	116	3,953	12
Gas, Illuminating & Heating.	2	2	55	.....	55	3
Galvanizing	2	2	33	.....	33	2
Glass, Cutting, Staining, etc.	10	4	329	18	347	9
Hats	2	1	64	102	166	6
Instruments—Professional ..	2	2	120	55	175	6
Iron & Steel Doors & Shutters	1	1	90	.....	90	2
Jewelry	3	1	23	.....	23	5
Junk	22	4	334	72	406	2
Lead—Bar, Pipe & Sheet...	3	2	34	.....	34	1
Leather—Tanned, Cured & Finished	8	4	1,120	.....	1,120	3
Lime	7	6	556	.....	556	4
Matches	3	3	1,313	469	1,782	7
Mirrors	5	3	89	.....	89	3
Musical Instruments	5	3	847	4	851	19
Oilcloth & Linoleum	3	3	240	.....	240	4
Oil—Linseed & Petroleum..	5	3	1,007	.....	1,007	4
Paint & Varnish	40	6	2,041	338	2,379	6
Patent Medicines & Compounds	1	1	47	48	95	2
Photo-engraving	2	4	36	.....	36	4
Porcelain Enameled Iron Ware	5	3	504	.....	504	9
Pottery, Terra Cotta, etc...	56	16	6,800	2,694	9,494	12
Printing & Publishing.....	34	5	2,325	390	2,715	11
Roofing Materials	3	3	135	6	141	4
Rubber Goods	32	14	22,173	2,887	25,060	20
Safes & Vaults	4	3	1,074	.....	1,074	9
Salt	1	1	135	15	150	2
Scales & Balances	3	3	650	50	700	10
Shipbuilding & Boatbuilding.	3	2	1,480	.....	1,480	7
Signs & Advertising Novelities	12	4	790	253	1,043	15
Smelting & Refining.....	4	2	45	.....	45	3
Springs—Steel Car & Carriage	6	4	653	.....	653	8
Stereotyping & Electroplating	6	3	229	.....	229	4
Stoves & Furnaces	15	9	5,104	56	5,160	16
Tin Plate & Terne Plate....	5	5	542	74	616	5
Toys & Games	4	2	569	56	625	9
Total	712	.....	135,572	13,768	149,340	.....

* General Factory Processes not included.

RECAPITULATION OF INDUSTRIES INVESTIGATED—Continued.

Name of Industry.	No. Est.	No. Cities.	No. Males.	No. Females.	No. Wage-earners.	No. Health-hazardous Processes.*
<i>Dust.</i>						
Brick & Tile.....	9	7	716	.....	716	2
Brooms.....	10	2	82	4	86	1
Cement Making.....	2	2	163	.....	163	2
Cooperage & Wooden Goods.....	1	1	390	.....	390	6
Cordage, Twine, Jute, etc..	5	3	434	76	510	6
Emery & Other Abrasive Wheels.....	2	2	112	.....	112	4
Flour & Grist Mill.....	2	1	85	.....	85	1
Grindstones.....	4	3	878	.....	878	1
Marble & Stone.....	19	5	705	.....	705	6
Mattresses & Bed Springs...	6	5	152	53	205	3
Paper & Wood Pulp.....	13	7	2,304	663	2,967	10
Wood—Turned & Carved....	2	1	81	4	85	4
Total	75	.....	6,102	800	6,902	.....
<i>Fatigue, Monotony, Etc.</i>						
Boots & Shoes.....	29	9	6,727	5,079	11,806	5
Clothing & Textiles.....	17	6	2,277	4,881	7,158	8
Flags, Regalia, etc.....	2	2	340	609	949	12
Iron & Steel Bolts, etc.....	4	2	1,090	494	1,584	7
Tobacco	27	13	1,791	4,463	6,254	9
Total	79	.....	12,225	15,526	27,751	.....
<i>Heat, Cold, Etc.</i>						
Bakeries.....	8	3	653	141	794	1
Canning & Preserving.....	13	11	685	661	1,346	3
Carbonated Waters.....	3	2	24	.....	24	2
Confectioneries.....	14	3	362	904	1,266	2
Glass.....	28	16	8,742	864	9,606	9
Ice.....	12	3	280	.....	280	3
Iron & Steel Blast Furnaces.	6	3	2,100	.....	2,100	2
Iron & Steel Forging.....	8	5	875	11	886	9
Iron & Steel Rolling Mills..	23	13	28,195	.....	28,195	22
Laundering.....	28	4	527	1,867	2,394	7
Liquors, Malt.....	11	3	1,055	.....	1,055	5
Soap.....	12	3	1,578	442	2,020	7
Wire & Wire Work.....	6	4	1,908	64	1,972	14
Total	172	.....	46,984	4,954	51,938	.....
<i>Miscellaneous.</i>						
Caisson Work.....	2	1	53	.....	53	1
Total	2	1	53	.....	53	1

* General Factory Processes not included.

RECAPITULATION OF INDUSTRIES INVESTIGATED — Concluded.

Name of Industry.	No. Est.	No. Cities.	No. Males.	No. Females.	No. Wage-earners.	No. Health-hazardous Processes.*
<i>Recapitulation.</i>						
Poisons	712	.....	135,572	13,768	149,340	.....
Dusts	75	.....	6,102	800	6,902	.....
Fatigue	79	.....	12,225	15,526	27,751	.....
Heat, Cold	172	.....	46,984	4,954	51,938	.....
Communicable Diseases, Misc. (Caisson Work)....	2	.....	53	.....	53	.....
Grand Totals	1,040	81†	200,936	35,048	235,984	.....

* General Factory Processes not included.

† Different cities and villages.

(To be continued.)

THE HYGIENE OF SPECIAL PROCESSES.

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(Continued from the September issue.)

STORAGE BATTERIES.

In the making of storage batteries (electric accumulators) lead plates are cast, usually in machine molds, dressed up, polished, brushed, and lead oxide pastes rubbed into them. The plates or elements are then connected together by soldering and lead-burning processes, using blow pipes as a rule, after which they are placed in lead-lined boxes or glass, or other impervious jars, dilute sulphuric acid added or other electrolyte, and then charged.

The process was investigated in 9 different establishments of which 4 employed but 1 to 3 men; also in connection with 1 automobile factory, 1 automobile repair plant, and 1 railroad shop. One shop employed no workers outside of the owners themselves, the total employes engaged in the remaining 8 plants numbering 529, all males. In no places could methods be regarded as modern, from the point of view of preventing lead poisoning. There were no unions. The attitude towards workers seemed good in 4 places, while interest in their welfare seemed to lag in the remaining. In the 2 largest plants workers were very largely ignorant foreigners, most of whom were unable to speak English. This would include fully 80% of all the workers so engaged. The steadiness of workers in the various processes was con-

siderably interfered with by sickness in the form of lead poisoning. Health protective appliances to remove fumes and dust were quite universally absent or were installed with more or less makeshift attempts, and greatly lacking in efficiency, particularly for the protection of the type of workers so employed. In the 2 large plants medical supervision was being developed at the time of our inspection, while instructions were being published for the workers upon the subject of lead poisoning and its prevention. How far such were intelligible to the workers we were unable to ascertain. Apparently too much was being expected of the physician and too little thought and money devoted to the correction of conditions. In 1 plant employing 6 men at this process the privilege of a sick benefit association was at hand, but the balance of wage-earners enjoyed no such insurance. The work was practically all unskilled. The hygienic construction of work rooms was good in 5 places employing a total of 57 workers, and bad in the remaining 3. Other work than that appertaining to the making of storage batteries was present in the same quarters in 4 small places, thus needlessly exposing such workers to the hazards of the storage battery business.

In practically all work rooms where lead *dusts* or pastes were used, the hazard to health was bad. Methods of generally doubtful efficiency were adopted here and there to prevent it. Employees were supplied with respirators which seemed to be the chief means depended upon to avoid the inhaling of dust. These were indifferently worn. Much of the dust came from the drying down of the pastes upon the work bench and the floor, where moving about stirred it up. There was also great risk from the fine lead dust deposited from fumes in the founding and casting quarters. General *cleanliness* of quarters, an extremely important feature in this line of work, was good in 4 small places, fair in 1, and bad in the remaining 3, which included the vast majority of the total number of workers. Impervious floors capable of flushing with a hose were a chief absent feature. There was some *dampness* and permanent wetting of floors in some places (as the charging rooms), but this constituted only a nominal hazard and employed few persons. In some places, quarters for a considerable number of the workers were poorly *lighted*. General room *ventilation* was good in 1 small plant, fair in 2 others, and bad in the remaining 5. In the melting and casting processes, *heat* was a fair hazard, although most (not all) of the melting pots and furnaces were fairly well hooded and drafted. Adequate washing facilities for most employes were very meagre, and for hot process-workers no shower baths were provided. *Fatigue* was a considerable factor in 1 place, fairly so in 1 other, and negligible in the remaining 6, the latter employing a total of only a few men, however. The chief factors were hurrying piecework, speeding up, monotony, prolonged standing, and faulty postures. The workday was 9 hours in 2 small places and 10 hours in the remaining 6 places. The noon recess was $\frac{1}{2}$ hour in 6 places, $\frac{3}{4}$ hour in 1, and 1 hour in the remaining 1, the last 2 employing a total of 11 persons. Occasionally overtime was necessary. Lead *poisoning* is the great hazard in this industry. There is some risk also from the careless handling of acids in pasting, soldering, lead burning, and charging. The chief factors inducing lead poisoning are the use of lead and lead compounds in dust, molten and fummy forms without proper mechanical confinement or removal of the same from the atmosphere which the workers breathed. The next feature is the employing of an ignorant type of laborer in a most poison-hazardous process,

—persons whom it is most difficult to instruct in personal hygiene. To accomplish anything here it is necessary to supply workers with special outer garments and keep them clean and in repair, to insist that workers do not eat in the workrooms (by all means proper eating quarters should be provided), that they carefully wash their hands, faces and lips, before eating or putting anything in the mouth, that they do not carry tobacco about in their work clothes so that lead dusts and fumes can contaminate the same, that they keep their finger nails trimmed short, their mustaches trimmed short, and that time be given them at least twice a day to attend to these matters,—preferably just before the noon recess and before quitting time, and that foremen be especially drilled to superintend the carrying out of such measures. A third feature is extreme *cleanliness* of floors, tables, benches, walls and ledges, by wet processes and vacuum cleaners, and the maintenance of the purity of the air by preventing its contamination in any way with lead in any form. Finally, the frequent physical examination of each worker by a competent physician. The industrial inducement to *alcoholism* is greatly favored in this industry by the presence of the poison element—lead—one of the effects of which is to create a craving for stimulants. The frequency of the association between alcoholism and lead poisoning is well known.

In two small places employing a total of 9 men, all were healthy *appearing*. In the remaining establishments, a few to many occupationally diseased workmen were seen. Most of these had prominent signs and symptoms of lead poisoning, sometimes of acute form with manifestations just beginning. In addition, numbers of persons reported attacks of colic, and disabilities lasting from a few days to several weeks which were unquestionably due to lead poisoning. Hospitals, dispensaries and physicians, in the vicinity of such works, gave many statistics of lead poisoning cases. The chief features of these are summarized in Part VI of this report. *Comments.*—Outside of the actual manufacture of the oxides and salts of lead, there is no industry covered in our survey which requires greater precautions against lead poisoning than the manufacture of storage batteries. The means necessary to prevent lead poisoning are summarized above. This is an industry in which conditions are much more to blame for sickness than to workers. These conditions have been successfully coped with elsewhere. It is only fair to say that the seriousness of these things is being more and more appreciated by manufacturers and that many improvements in these same plants have been under way since our inspections were first made, with the result that there has been a noticeable dropping off in the number of reported cases of lead poisoning, when the year 1914 is compared to the year 1913.

The reader is referred to the rules and precautions for the prevention of lead poisoning formulated by the Committee on Storage Batteries, Association of Edison Illuminating Companies, adopted September 15-17, 1914, and approved by the American Museum of Safety (see "Safety," Vol. 2, No. 9, Oct. 1914, p. 219, — 29 West 39th St., New York.) Furthermore, the Ohio State Board of Health has a large placard upon "Instructions to Employees—How to Prevent Lead Poisoning," intended for posting up in workrooms. These instructions were published in the Bulletin of the State Board of Health for June, 1914, p. 845, and are given in Part VII of this report.

DRY BATTERIES.

The manufacture of dry batteries was investigated in 3 establishments, in 3 cities, in which a total of 978 wage-earners were engaged at this process, of whom 761 were males and 117 were females. There were no union organizations in any of the places. The general welfare attitude towards the workers, the type of the workers, and their retention at work seemed good, fair and bad in each of the places respectively. There were no adequate health appliances, no instructions or placards along health lines, nor sick benefit associations. The work was almost entirely unskilled labor.

Dust was a bad hazard in 2 of the places, and to a fair extent in the third, due to the large amount of carbon and "battery dust" used. In one place the men kept faces covered with talcum to prevent "skin from peeling off" in handling hot pitch. One plant was also quite *dark*, and not kept clean. General *ventilation* seemed good in all three places. *Fatigue* was not much of a factor. General sanitary arrangements were usually good, but on account of the dust and the usual absence of cuspidors there was considerable risk of spreading *communicable diseases*, particularly as no medical supervision obtained. Creosote, pitch, benzol, hydrochloric acid, zinc chloride, lead (soldering), mercury (amalgamizing), and the organic bodies found in carbon constituted the *poisons* present; the hazards from all were considerable. In 1 place a large percentage of the workers were pale and anemic looking, in the other 2 places their *appearances* were somewhat better. Our investigators found several cases of skin trouble, with redness, fissuring and itching; also cases of unquestioned consumption; and in some instances of acid burns and zinc chloride burns. *Complaints* were frequent of fumes, dusts, acids, etc. A prominent surgeon in Cleveland claims to have had several cases of epitheliomata (cancer of the skin) from these workers and thinks they resemble in origin the same class of neoplasms which affect chimney-sweeps. An officer of a company in another city stated that he knew of 3 of their employes who had worked, subject to carbon dust, and who were said to have died of cancer which began in the mouth.

Comments.—It would require an intensive study to determine how best to protect this class of workers. It is well enough to say "local exhausts, hoods, gloves, etc.", but the exposure to the dust is unusual, and very difficult to control. Probably chemists, engineers and sanitarians could suggest some changes in methods which would suffice. It must be remembered that most of these employes probably do not have the cancers develop until years after leaving the employ of the firms.

INCANDESCENT LAMP MANUFACTURING.

As the processes in this industry, with the exception of glass blowing, are quite different from those elsewhere described, it is considered best to take them up separately at this place. The industry was investigated in 7 plants located in 5 cities and employing a total of 1995, of whom 447 were males and 1548 were females. Of this number 82 males and 577 females were engaged in the particular processes discussed here below. The general type of workers was good in all places. Very good effort was made to retain them. There were no union organizations. Considerable attention has been given to health appliances, especially in 5 places. There were no sick benefit organizations re-

ported, though in 1 place a beginning was being made for such. None of the work was of a skilled character. * Premises were of fair to good hygienic construction and arrangement in 6 places and not so in 1. Efficiency auxiliaries such as organized welfare promotion, pleasant surroundings, instructions in personal hygiene, and disease prevention, were advantages enjoyed by the workers. Age groups ran very largely to younger persons, there being but 18 over 40 years of age, 455 between 20 and 40, and 174 under 20.

In some departments in 5 places glass *dust* from broken fragments was a moderate hazard, although frequent cleansing by wet methods existed. Respirators were furnished in sand-blast-departments but were little used by the workers. Much of the work was of necessity done in *darkened* rooms and in rooms in which green window-panes obscured the natural light. In 6 places the general room *ventilation* was of no more than fair character, while *heat* was a fair hazard in the same number of places. A considerable amount of *hurrying piecework* was noted in 5 places, much of it of monotonous character, and especially trying upon the eyes, due to flashing of lights, to brightness of lights and to working with fine filaments. The workday was between 8 and 9 hours in 6 places and 10 hours in 1 place, the noon recess being 1 hour in 4 places and $\frac{1}{2}$ hour in the remaining 3. All places had good rest rooms, employed a factory nurse, required their employes to leave the workrooms at the noon hour, and to eat in the lunch rooms provided for the purpose. At this time the windows of workrooms were widely opened. Considerable study had been given to the subject of eyestrain, and in practically all places seats were provided for stationary work. The liability to the contraction of *communicable diseases* was a fair hazard in parts of places, due to such factors as the use of common towels, crowding (irrespective of room space), flying particles, frequent trivial injuries and short-intervalled common handling of objects. On the other hand these conditions were found to have been anticipated by first-aid equipments, surgical rooms, good wash places and closets, the keeping of sick records, the supplying of goggles, asbestos finger cots, and in some plants individual lockers and individual towels. Mercury, wood alcohol, phosphorus, escaped gas fumes, and solder, were the chief *poisons* concerned. None were exposed to mercury, which was used in closed containers to produce a vacuum. The red phosphorus was used free of the white or yellow variety in painting, and the risk of lead poisoning from the grade of solder used and its manner of use seemed negligible. On the other hand in many places the air was considerably devitalized by numerous gas flames and contaminated by the escape of fumes from the same. In other places exhaust flues locally applied seemed ample. In certain processes wood alcohol fumes were unduly strong, due to lack of prompt air exchange. In at least 1 place the girls' fingers and hands were moistened through sponging with wood alcohol. The industrial inducement toward the *taking of stimulants* was some factor, due to the effects of eye-strain, fumes and fatigue. Good drinking water facilities were present in all places.

In all places a few or more workers were seen who were not *healthy looking*. Their chief *complaints* were eye trouble, causing a considerable amount of headache among a goodly number of employes. While this was laid to strain, we are not certain that some of it was not due to wood alcohol. Less often were mentioned foreign bodies in the eyes, trivial cuts and burns, and

here and there, one stated that wood alcohol fumes caused headache, and solder fumes caused sore throats.

A summary of the chief hazards in each department of the process is here given. *Filament Making*.—Wood alcohol, inadequate room ventilation, gas fumes, heat, presence of other processes, hurrying piecework and monotony. *Tubulating, Sealing and Painting*.—Gas fumes, heat, wood alcohol, some constant standing, broken glass dust, monotony and hurrying piecework, presence of other processes, sometimes crowding, small cuts and burns, foreign bodies in the eyes. *Filament Mounting, Spidering and Winding*.—Eye-strain from fine work, wood alcohol, gas fumes, warm quarters, the presence of other processes, inadequate room ventilation, some crowding, hurrying piecework and monotony, foreign bodies in the eyes, small cuts and burns. *Vacuum Production*.—Eye strain from bright and flashing lights, presence of other processes, heat, some crowding, some escape of gas fumes, hurrying piece-work and monotony. *Photometry and Aging*.—Eye-strain, due to bright flashing lights, some constant standing, heat from lamps, presence of other processes, some crowding, hurrying piece-work and monotony, inadequate room ventilation. *Finishing Processes*.—Some escape of gas fumes and solder fumes, a little eye-strain, wood alcohol, troublesome calluses produced by the use of wire cutters, some hurrying piece-work and monotony, inadequate room ventilation.

Comments.—In all places most of the hazards above enumerated had evidence of being given considerable thought by the managements. However, contrast conditions were frequent; for instance, little attention was paid to heat in some places while cool air blasts were found installed in others, for similar work. Lack of co-operation on the part of some of the employes was unquestionably a troublesome factor at times. For general room ventilation exhaust fans in the walls were installed in many places, in some, rather too high up, we believed, to be of good service. The addition of air-agitators, preferably the large paddle, slowly revolving type, would help greatly in quarters where many gas burners and methyl alcohol are used. Atmospheric determination instruments, such as the room thermometer and hygrometer are called attention to, especially for warm quarters where youths and females predominate. The examination of employes for physical fitness, already inaugurated, should be greatly extended.

RUBBER. — WASHING.

This process consists in the cleansing and preparing of crude rubber by "cracking" it up in mills, both warm and cold, with running water, after which the rubber is further steeped in large tanks of water.

The process was investigated in 11 establishments. There was a total of 279 wage-earners, all males. The employes were very largely foreigners, many of whom spoke very little English. Outside of their own shifting tendencies they were found to be well retained by their employers. The work is unskilled. Health appliances, such as floor drains, elevated floor treads, the supplying of rubber aprons, boots and gloves were found to be sufficient in 5 places, while 4 others made little attempts along these lines. Work hours were 8 per day in 1 place, 10 hours in 9 places, and 11½ to 12 hours in 1 place. The noon recess was 30 minutes in all except 1 place. Ninety-five per cent of the workers were under 40 years of age. The general construction of the workroom was found to be hygienic in 7 places and fair to bad in 4 others. The process was

usually by itself, but in 2 places the mixing and calendering mills were in the same room.

Some soapstone *dust* was used in 5 places, and in 1 place contaminated the air badly. The quarters were kept *clean* and *orderly* in 8 places, while, in 3, waste-products were allowed to accumulate and dry out; furthermore, dry cleaning during work hours was done. The process is necessarily damp and steamy, and because of the absence of ventilators for steam, the *humidity* was excessive in 6 places, and fairly so in 5 more. Wet floors were common. *Light* was good in 7 of the rooms, fair in 3, and poor in 1. Outside of the humidity, the *air* was good in 5, fair in 5, and bad in 1, due to faulty general ventilation of quarters. Rubber *odors* were pronounced in some confined quarters. The *temperature* was satisfactory in 7, and rather uncomfortably warm in 4 places. Washing facilities were poor in 6 places, while but 1 provided a shower bath. Lockers were present in 5 places and change-rooms in but 2. Day work was the rule. *Fatigue* was hardly a factor. The contraction of *communicable diseases* was very possible in 2 places, fairly so in 6, and practically nil in 3. The hazards were common cups, inadequate washing places, poor closets, spitting about the floors, absence of cuspidors, and the lack of medical supervision. *Poisoning* was not a hazard in this process of itself. In 3 plants, lead and antimony were being used in dust form in the same room, with considerable liability to poisoning all the workers. *Alcoholism* was favored in 8 places by the lack of good drinking water facilities, the depressing effects of humidity, and absence of change-rooms for removing wet work-clothes and drying them out before the next day's work.

The workers were found to be healthy in *appearance* in 8 places, while in 5 others 1 or more sickly looking men were observed.

RUBBER. — COMPOUNDING.

The mixing together of various ingredients, usually metallic oxides and salts to be mixed with the rubber later, is termed "compounding". According to the various formulas, the dry powders are scooped out of bins and weighed by hand, placed in opentop tin boxes, and carried direct to the mixing mills, or delivered close thereto through pipes, by gravity. Occasionally, the ingredients are first bolted in shakers in a room above, to break up lumps. Unless the shaker is well enclosed, this is exceedingly dusty work. Sometimes anilin oil is poured directly upon the weighed powders from an ordinary cup.

This process was investigated in 16 establishments, employing a total of 151 wage-earners, all males. Methods were considered fairly modern in 6, and as clumsy and antiquated in 10 places. The attitude toward workers appeared to be good in 12 places, fair in 3, and poor in 1 place. The workers were intelligent laborers in 7 places and ignorant foreigners in 9 places. The firms made an apparently serious endeavor to retain workers in 6 places, fairly so in 7 others, while in 3 the attitude toward the workers in this process appeared to be that of "If you don't like the work, quit". Adequate health appliances were not found in any place, but the use of closed hoppers, conveying pipes and receptacles, kept down dust considerably in 5 places. In no places were complete dust exhaust systems found, while in 11 places very little attempt was made to limit dust in the air. This fact was surprising, inasmuch as in all other departments of most of these plants, considerable attention was

given to health appliances. In but 1 plant were the workers given instructions by a competent person on the avoidance of lead poisoning. The work day was 10 hours in 14 places, 9½ hours in 1 place, and 8 hours in the remaining 1. The noon recess was ½ hour in 11 places, 1 hour in 4 places, and not ascertained in the remaining 1. There were usually but 1 or 2 men considered skilled in each place. The vast majority of the men were between 20 and 40 years of age. The workrooms were hygienically constructed in 8 places, fairly so in 3, while in 5, poorly so. The process was found in all places to be done in a room or space by itself, although, in many, wide doors and window-ways gave free air access to adjoining processes.

Metallic and poisonous *dusts* contaminated the air badly in 6 places, and fairly so in all the balance. *Dust* and waste-product *accumulations* upon walls, windows, ledges and floors was bad in 4 places, and present to a fair extent in the balance. Dry sweeping during work hours was frequently noted. *Dampness* is not a feature of the process. *Light* was found to be good in 12 places and only fair in 4 others. Room *ventilation* was excellent in 1 place, good in 11 others, and poor in 4 places, the latter due, principally, to confined quarters and the presence of fumes. There were no artificial ventilating systems found. *Temperature* is not a factor in the process. The work is not fatiguing to any extent. The contraction of *communicable diseases* was highly possible in 4 places, fairly so in 8 and practically nil in 4 others, the chief hazards being the use of common cups, improper or absent wash places and closets, spitting upon dust laden floors, the absence of cuspidors, and the lack of physical examination of employees. *Poisoning* by lead and antimony in the shape of dust, and occasionally, anilin in the shape of oil or fumes, was easily possible in 11 places and fairly so in the remaining 5. The chief factors were the dustiness of the work, the ignorance of the workmen, lack of instructions, the wearing of mustaches and even beards, the eating and chewing at work and in the workrooms, the non-observance of personal care, lack of medical supervision, of proper gloves, the invariable lack of respirators, also clothing supervision, lockers, washing facilities, and, as mentioned above, mechanical protection from the dusts. The industrial inducement to *alcoholism* was decided in 3 places, and fairly so in 8 others, due to the lack of good drinking water facilities, the subjection to the dust and poisons above cited, and the belief among the workers that alcohol prevents metal poisoning!

In no place were all the workers perfectly *healthy appearing*, while in 5, some very sickly looking men were seen. The chief *complaints* of the working men, where they could speak English, were dust and, occasionally, fumes. *Occupational diseases* were encountered as follows in 8 places:

Lead poisoning, positive.....	22 cases.
Lead poisoning, tentative.....	5 cases.

Several of these cases had partial paralysis. There were, in addition, 2 cases of acute anilin poisoning reported, but not seen by the investigators, and numbers of hearsay cases of lead poisoning. *Comments.*—Much greater supervision of workmen is necessary in this process, including at least monthly examination of all the workers for signs of lead poisoning, while we feel certain that the ventilating engineer could render the work practically dustless. The hazards named above indicate other precautions.

RUBBER. — MIXING MILLS.

In this process, the previously washed and dried rubber is macerated between steel rolls, while, at intervals, the workman pours upon the rolls a scoopful or cupfull of the ingredients, delivered to him from the compounding room.

Our findings covered this process in 21 establishments, employing a total of 525 wage-earners, all males. The attitude toward the workers was good in 15 places, and at least fair in the balance. The workers were English-speaking in 6 places, but in the remaining the large majority were ignorant foreigners. An endeavor to retain the workers at the process was evident in 20 places and not so in 1. Health appliances, consisting of hoods and ventilating ducts, some-

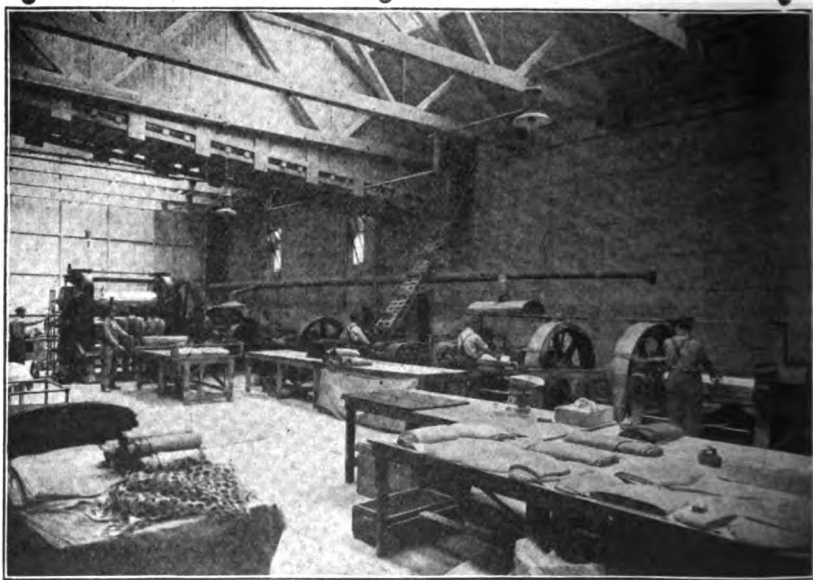


FIG. 53. RUBBER MANUFACTURE — MILL AND CALENDER ROOM.

From right to left are two mixing mills, a refiner with a conveyor belt, a warming mill and another mixing mill. The 3-cylinder-high calender is shown at rear.

times with partial curtains, or aprons, placed over the mixing rolls, and with exhaust fans, were found in 3 places; 7 other places had exhaust fans in the upper parts of the room, the value of which, however, was questionable, since, without hoods and vents over the mills, these only tended to suck up the dust into the air. In the balance of the places (11) there were no health appliances of any sort. The noon hour was a 30 minute recess in 5 places, 45 minutes in 2 places, and 5 allowed 1 hour. Overtime was also frequent in 7 places. The work is not a skilled process. Three boys under 20 were observed, and less than half a dozen of the total workers were over 45. The work rooms were constructed hygienically in 10 places, fairly so in 7, and not so in 4. The process was practically by itself in 14 places, and, in the balance, was in the same room with Rubber Washing, Calendering, or other processes.

Dust in the atmosphere was observed in all places. In 10 it was present to only a fair degree, while in 11 places it was bad. The dust consisted of the dry ingredients (Al, Fe, Ca, Zn, Pb, Sb, Soapstone, etc.), which go into rubber,—lead ranging, according to one analysis of the finished product, as high as 25%. Dirt and waste-product *accumulations* were evident upon the floors, machinery, ledges, etc., in all places, though to only limited extent in $\frac{3}{4}$ of them. Dry sweeping and considerable negligence obtained in 7 places. *Dampness* is not a feature of the process. *Light* was good in 16 places, fair in 4, and poor in 1 (located in basement). Room *ventilation* was good in 2, fair in 15, and poor in 4 places, the latter due to bad location, presence of burnt rubber odors, the biting fumes of antimony, and the absence of a room ventilation scheme. *Heat*

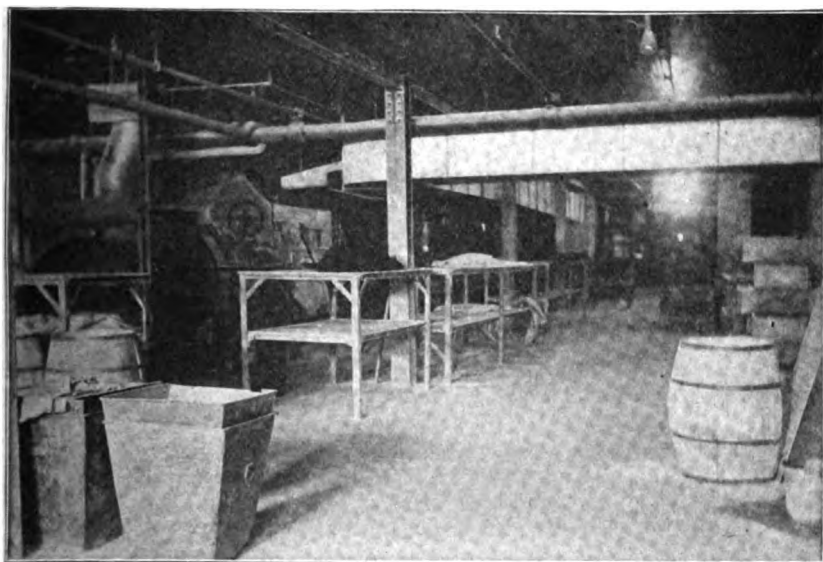


FIG. 54. RUBBER MIXING MILLS.

There is a row of these mills on the left with exhaust hoods to remove poisonous dusts and fumes. Note air-conditioning pipes running full length of room, protected machinery and batch tables within easy reach.

was not a great hazard, although the warming mills rendered the temperature fairly hot in 8 places, and badly so in 1 confined place. Washing facilities were meagre as a rule. The work is not overly *fatiguing*. The work day was found to be 8 hours in 1 place, 9 to 10 hours in 20 places, while in 5 places night shifts worked for as long as 11 to 12½ hours. Piece-work was the rule, limited by certain restrictions to safe-guard quality of output. Noise was also something of a factor. The contraction of *communicable diseases* was very possible in 9 places, fairly so in 10 others, and practically nil in 1. The hazards were the use of common cups, promiscuous spitting upon the dusty floors, absence of cuspidors, and lack of physical examination: in some places first-aid provisions were lacking. *Poisoning* was about as great a hazard as in the compounding

room, due to the same ingredients, which, in dust form, were here scooped out of conveyance boxes and poured upon the rolls. Here and there anilin oil was similarly handled. The risks of poisoning were considered bad in 13 places and fair in the balance, due, principally, to the ignorance of the workers, lack of instructions, wearing of mustaches, eating and chewing while at work and in the work room, lack of personal care, interval medical examinations, adequate washing facilities, and, in most places, lack of process-ventilation appliances to remove dusts and fumes. The odors of anilin and antimony fumes were plainly detectable in several places. Industrial *alcoholism* was greatly favored in 4 places, and fairly so in 15 others, due to improper drinking facilities and the various hazards above cited.

Appearances of the workers were good in 4 places, but in the balance some sickly looking individuals were observed. Their chief complaints were found to be the breathing of dust and fumes, nausea due to odors, the closeness and stuffiness of the workrooms, and the symptoms of poisoning—usually lead. Our investigators discovered 30 cases of occupational diseases as follows:

Lead poisoning, positive.....	22 cases
Lead poisoning, tentative.....	4 cases
Dermatitis, positive.....	1 case
Anilin poisoning, positive.....	3 cases

Comments.—While means of confining or drawing off the dusts and fumes from each milling machine are necessary precautions, personal care, properly taught and supervised, with a monthly examination of the workers, would obviate all of the cases of lead poisoning.

(Next month the subject of Rubber Manufacturing will be continued.)

METHODS OF DESTROYING LICE.*

In the British Medical Journal of June 19, 1915, appeared a report entitled "An Investigation of the Best Methods of Destroying Lice and Other Vermin," by J. Parlane Kinloch, M. D., lecturer in public health, University of Aberdeen. The investigation was made with a view to the control of vermin among troops and the prevention of the spread of typhus fever. The author's conclusions and his statement of their practical application are here quoted:

CONCLUSIONS.

"1. The louse can be bred and reared in the incubator under suitable conditions of temperature and moisture. Constant conditions for breeding and rearing lice in the incubator remain to be determined.

"2. Dry heat is more effective than moist heat in destroying lice and their eggs. The louse can be revived after immersion for one minute in water at 100° C. Exposure to a dry heat at the same temperature and for the same time appears to kill both lice and nits.

* Reprint, Public Health Reports 1915.

"3. The paraffin bodies are actively insecticidal, and of these petrol (gasoline) is the most effective. Lice and their eggs are destroyed by immersion in petrol for one minute, and they may be killed by exposure to the vapor of petrol for half an hour.

"4. Powerful fatty solvents other than the paraffins are actively insecticidal. Benzene, toluene, and acetone are as toxic to lice as petrol. Certain chlorine derivatives of methane, ethane, and ethylene are more lethal to lice than any other substances, and have the important merit of being noninflammable. Immersion in the chlorine derivatives of ethane and ethylene immediately destroys all lice and nits, and exposure to the vapor of these substances for five minutes is equally destructive. Even soap solutions containing 2 per cent of trichlorethylene are capable of killing in half an hour at ordinary temperatures all lice and nits.

"5. A 25 per cent solution of dichlorethylene or trichlorethylene in vaseline when applied to the human body has been found capable of exerting its insecticidal action for hours. The action of a 25 per cent solution of petrol in vaseline is of shorter duration, but is also effective for some hours.

"6. The common phenol disinfectants, in their usual degrees of dilution for disinfectant purposes and at ordinary temperature, fail to kill lice or nits, even after steeping for half an hour, but become efficient as insecticides if the temperature of the steeping tank is maintained at 65° C.

"7. The volatile oils have no direct insecticidal effect. In a moist vapor of oil of wintergreen, oil of cloves, oil of caraway, oil of turpentine, oil of eucalyptus, oil of thyme, etc., lice live for many hours at body temperature, and can be revived after immersion in these oils.

"8. Over solid substances, such as iodoform, camphor, and paraform, and in contact with them, and in contact with garments impregnated with sulphur, borax, black hellebore, alum, etc., lice appear to remain practically unaffected.

"9. The hungry louse feeds on the human body previously anointed with sulphur ointment, balsam of Peru, mercury oleate ointment, chrysarobin ointment, stavesacre ointment, and hellebore ointment. The louse certainly prefers the clean body, but it can feed on the body thus anointed and thereafter survive.

"10. It has still to be determined whether some of these bodies that have been shown not to be actively insecticidal may not have, when rubbed on the body or placed in clothing, a useful repellent effect on body vermin.

"PRACTICAL APPLICATION.

"For practical purposes it has been found that destruction of lice and nits is best secured by immersion of verminous garments and bedclothes in a petrol (gasoline) or benzene bath. Danger from fire and waste of petrol are avoided by using such a bath and extractor as are employed in a dry-cleaning apparatus. In such an apparatus 90 per cent of the petrol or benzene is recovered for future use. A petrol or benzene bath is necessary, especially for uniforms and woolen garments generally. Where the clothing is such that it is not injured by immersion in water, steeping the garments for half an hour at 12° C. (54° F.) in a soap solution containing 2 per cent of trichlorethylene or 10 per cent of tetrachlorethane secures destruction of lice and nits. It is only fair to say that the only soap solutions that I have so far experimented with are those sold as 'Westropol' and 'Westoran.' Steeping for half an hour in a 5 per cent solution

of cyllin in water maintained at 65° C. (149° F.) is also effective, and this temperature has no injurious shrinkage effect on woolen articles.

"For economical reasons the chlorine derivatives of ethane and ethylene can not at present be used in a dry-cleaning process, but their soap preparations are of value. Petrol has a wide application and is readily obtained.

"For cleansing the body itself, bathing or sponging with soap solutions containing 2 per cent of trichlorethylene or 10 per cent tetrachlorethane gives the best results.

"In view of the known insecticidal action of these chlorine derivatives of ethylene and ethane it is probable that good results would be obtained by shampooing verminous heads with their soap preparations, and it is also probable that a 25 per cent solution of trichlorethylene in vaseline would form an efficient insecticidal pomade.

"It is almost certain that lice would not continue to live on the human body if anointed daily with a 25 per cent solution of trichlorethylene in vaseline, or on the body anointed twice daily with a solution of petrol in vaseline of similar strength. The odor of such an ointment is not unpleasant. But living under verminous conditions constant precautions would have to be taken and every method of destroying vermin would require to be employed.

"Means for the destruction of lice are available. Any attempt to render an army free from vermin in war time would require that all men occupying the same quarters at the same time, or for alternating short periods of time, would be regarded as a single unit, for which a receiving station with cleansing apparatus would be provided. Such an attempt would also require that the movements of the men off duty were controlled. It would be limited by immediate military necessities.

"There is reason to believe that vermin are responsible for the transmission of the infection of typhus fever, and Nicolle has shown that the louse can convey the infection. Epidemics of typhus fever come and go, and the amount of any epidemic will be influenced by the verminous conditions prevailing. In dealing with typhus patients vermin must first be destroyed by some of the methods above described. Ambulance men and receiving nurses are to be similarly protected, or, if available, a staff of ambulance men and receiving nurses already immune by a previous attack of the disease are to be employed."

SEPTEMBER MEETING.

The monthly meeting of the State Board of Health was held at the Hollenden Hotel last night.

A public hearing was given the officials of Hicksville on the complaint that sewage and other wastes from this village were polluting nearby water courses. After a consideration of the report and evidence, the State Board of Health adopted an order requiring the village of Hicksville to install and have in operation within three years from the date upon which the order is approved by the Governor and Attorney General the necessary sewers and a sewage treatment plant to collect the sewage from the village and to correct the pollution of Mill Creek and laterals.

Plans were approved for a public water supply for the village of Belleville, Richland County, subject to the condition that the village council pass an ordinance to prevent the establishment or maintenance of any leaching cesspool or privy vault or other possible source of pollution of the water supply within five hundred feet of any supply well.

Plans were approved for a proposed reservoir to be used in connection with the public water supply of the village of Bluffton in Allen county, upon condition that the present receiving cisterns and other proposed reservoir should be provided with covers of satisfactory design to prevent deterioration of the stored water and that the present emergency intake from a quarry pond be abandoned and removed.

Plans were approved for a proposed water purification plant for the village of Napoleon, Henry County. The village officials must extend the waterworks intake into the channel of the Maumee River whenever deemed necessary by the State Board of Health. It is also provided that before the proposed water intake is placed in use the outlet of an existing storm sewer which discharges into the tail race of the hydro-electric plant at the latter's confluence with the Maumee River be abandoned and outlet provided for the same into the Maumee River at a point at least five hundred feet below the proposed waterworks intake.

Plans were approved for an improved water supply and water softening plant for the Combined Normal and Industrial Department of Wilberforce University in Greene County. The spring now used as an alternate source of supply must be abandoned and disconnected from the water supply system and the authorities of the institution are charged with the duty of preventing the establishment of any source of pollution within five hundred feet of the supply wells.

General plans for a proposed storm sewer for the village of Ada, Hardin County, were approved with the provision that detail plans for this sewer will be submitted to and approved by the State Board of Health and that the village council pass an ordinance prohibiting the establishment of any connections to the proposed sewer or laterals thereto for the removal of sewage or other objectionable wastes. The attention of the village officials is called to the fact that the misuse of storm sewers at Ada has resulted in a public nuisance and a menace to the source of water supply of the city of Lima and that this condition can only be corrected by the installation of a complete system of sanitary sewers and sewage treatment works and by retaining the present sewers in use for the removal of storm water only. It is recommended that steps be taken immediately to secure plans for a proper system of sewers to be installed at the earliest possible date.

Plans were approved for proposed sewerage and a sewage treatment plant for portions of East 94th and East 96th Streets in the city of Cleveland. It is required that the city shall provide for the proper maintenance of the sewage treatment plant and the disposal without nuisance of the sludge removed from the tank and that the proposed plant shall be abandoned and removed and connection made to a trunk sewer as soon as such sewer shall have been installed.

Approval was given to plans for proposed additional sewerage for the village of Cuyahoga Falls, Summit County, with the condition that all the existing sanitary sewer connections within the district to be served by the proposed sewers shall be made tributary and constructed and used in accordance with an

ordinance as required by a condition of approval of detail plans for a proposed system of sanitary sewers granted February 25, 1915. The proposed temporary outlets must be abandoned prior to August 1, 1916 and connections established to the trunk sewers to be installed prior to that date.

Plans were approved for proposed sewage disposal for the institution of the Society of Mary in Montgomery County, with the condition that the proposed sedimentation tanks shall be cleaned at least once each year and the sludge removed and properly disposed of by burial and that the proposed leaching cesspool shall be abandoned and removed and suitable secondary treatment devices installed when deemed necessary by the State Board of Health. A well used as a source of water supply and located about five hundred feet from the leaching cesspool is to be abandoned and filled before the proposed sewage disposal devices have been placed in service.

The Board voted to withhold action on plans for a proposed intercepting sewer for the village of Uhrichsville, Tuscarawas County, on the ground that while an intercepting sewer to divert from existing outlets the sewage now discharged into Little Stillwater Creek might be satisfactory with respect to the pollution of the stream, it does not provide for the ultimate treatment of the sewage which may be required. Following the action taken at the last meeting, the Board renews its requirement that the villages of Uhrichsville and Dennison have made a thorough sewerage survey and have plans and estimates of cost prepared for the collection and disposal of sewage and deems it advisable to withhold action on the proposed intercepting sewer until such plans and estimates have been prepared.

Plans were approved for sewerage and sewage disposal for the Eagle Point Colony in Wood County. It is required that the Eagle Point Colony Realty Company shall, when deemed necessary by the State Board of Health provide satisfactory devices for secondary treatment of the sewage and abandon the proposed method of disposal of sewage involving the discharge of the effluent into the Maumee River and that it shall provide for the proper care of the treatment devices and the cleaning of the sedimentation tanks when necessary.

Miss Amy L. Mercer of Lakewood was appointed as Public Health Nurse in the Division of Public Health Education and Tuberculosis. Miss Mercer will take charge of work in connection with admissions to and discharges from tuberculosis hospitals and sanatoria.

Miss Rose M. Foster of Cleveland was appointed as Public Health Nurse in the Division of Public Health Education and Tuberculosis. Miss Foster's work will be done under the authority of recent legislation for the prevention of blindness.

Dr. Frances M. Hollingshead of Cincinnati was appointed as Director of the new Division of Child Hygiene.

E. J. Wellman of Toledo was appointed as Deputy State Inspector of Plumbing. Dr. R. P. Albaugh of Winchester was appointed as a Medical Assistant in the Division of Industrial Hygiene.

All of these appointments were made from lists certified by the State Civil Service Commission.

The Board was informed by the Secretary of the adoption of a resolution by the Industrial Commission of Ohio appointing Dr. E. F. McCampbell, Secretary and Executive Officer, and Dr. E. R. Hayhurst and Dr. R. P. Albaugh of

the Division of Industrial Hygiene as an advisory committee on the subject of Industrial Hygiene and kindred matters.

The Board approved the site for a proposed district tuberculosis hospital to be erected by Ross, Pike, Scioto, Jackson, Highland and Fayette Counties. This site having been investigated by the Director of the Division of Public Health Education and Tuberculosis and the Director of the Division of Sanitary Engineering and the Secretary of the Board of State Charities.

Orders and regulations were adopted governing the sale of ice cream, sodas and soda fountain sundries. These orders and regulations with a circular letter to boards of health and health officers and the provisions of the laws of Ohio relating to the enforcement of the orders and regulations adopted by the State Board of Health will be found at another page in this number.

On September 24th, the members of the Board inspected the new water purification plant for the city of Cleveland. This plant is nearing completion and will probably be ready to furnish water to the citizens of Cleveland about January 1, 1916. The inspection was made at the request of the engineering Department of the city.



EDITORIAL SECTION.

Policemen as Sanitary Inspectors.

The question of efficient sanitary policing has always been a source of trouble to health departments. The expense of maintaining a sufficient force of sanitary inspectors is almost always too great for the average municipal health department. The small appropriation available for this purpose restricts the individual compensation, and inferior and untrained men are selected. As a matter of fact the average municipal health department faced with this problem chooses one of two solutions, both bad. In the one case too large a proportion of the department's appropriation is expended for inspection service and the other and more important divisions of work are neglected. If the opposite policy is pursued, a sufficient number of inspectors for covering the health district cannot be secured without restricting the individual's compensation to such an extent that a very inferior type of inspector is the result.

Sanitary inspection is an important division of the health department's work. It is by means of the inspection service that the department is brought into close touch with the public. A great deal of the indifference with which the public treats the health department may be traceable to inferior inspectors, for as a rule the public comes in contact with the health department only through its inspection service. Judged by their forces of sanitary inspectors how many health departments make a good impression in the eyes of the public?

The sanitary inspector should be a trained and disciplined individual. He should be thoroughly familiar with the health laws and regulations and should be sufficiently well educated to use correct English in conversation and in making reports. He should be patient, yet firm, and always polite and dignified. In person he should be neat and clean, and a uniform of some kind should distinguish him from the civilian population. In the smaller cities especially, the average health inspector is just the reverse of all this and for the reasons stated above, namely, insufficient compensation, too large districts, inferior men, and no discipline. In order to solve the question of efficient sanitary inspection without too great expense, several cities have experimented with policemen. The policeman is an individual who comes into close personal touch with the people and is the embodiment of the law. He is disciplined, neat, usually patient and firm, and his uniform distinguishes him as an officer of the law. He is usually well acquainted with the question of nuisances and may easily be taught other phases of sanitary inspection. His "beat" is smaller than the average sanitary inspector's district and a considerable portion of his time may be devoted to sanitary inspection without detriment to his ordinary police work. So far the employment of policemen as sanitary inspectors has met with considerable success. While yet in the experimental stage there is sufficient evidence already collected to indicate the problem of sanitary inspection is near solution. In conclusion the advantages of this method of sanitary inspection may be summarized as follows:

1. More efficient prevention of nuisances and a cleaner and more decent city.
2. Greater efficiency of health department because its activities are no longer restricted to routine inspections.

3. Cooperation between police and health departments—really only a step in the right direction for all municipal departments should be closely coordinated.
4. No added cost to city.

This method of sanitary inspection and the resulting advantages are possible only in a city where a well organized police department is maintained.

* * *

Diphtheria: A Serious Problem in Ohio.

To understand the seriousness of diphtheria to the health of the citizens of Ohio, it is only necessary to read the statistical returns of deaths for the period 1909-1914. During this six-year period, there was an average annual loss of 806 lives, or a total of 4,836 deaths. Over two thousand deaths occurred in 1912 and 1913, and in 1912 the number of deaths from this cause exceeded the number of deaths from typhoid fever. Diphtheria epidemics occur in cycles and it may be that the period for which statistics were available, 1909-1914, the greatest prevalence of the disease, and that preceding and succeeding years may have exhibited a much smaller loss of life from diphtheria. This is only a supposition, however, and the contrary might just as easily be true.

It is unfortunate that a disease of which we know more than any other, should be so prevalent in Ohio. It is surely an indication that public health administration in our state is lacking in some essentials. The exciting cause of diphtheria is known and can easily be recognized by its characteristic morphology. In diphtheria antitoxin we possess not only a curative but an immunizing agent of no mean importance. The Schick test enables us to detect those who are susceptible among contacts, and several fairly successful methods of treating carriers have been developed. The means of transmission of the disease are known and are, therefore, rather easily prevented. Nevertheless, diphtheria continues to spread and to cause many deaths. One of the reasons for this excessive prevalence of diphtheria in Ohio is the fact that few health departments utilize the facts known about the disease in their campaign against diphtheria. Few use the cultural method of dismissing cases and carriers, and still fewer use cultures to detect possible carriers among school children or other bodies of susceptible individuals. In many cities, much progress has been made because of a system of physical supervision of the school children. This measure is effective against diphtheria as against all other communicable diseases affecting children of school age. The infrequent use of diphtheria antitoxin is one reason why deaths from diphtheria are so numerous in Ohio. Many mild cases occur and when antitoxin is not used because of the mildness, paralysis of the heart muscle occurs and death results. In many cases antitoxin is not given early enough because of delayed diagnoses. It is not unusual to find several deaths occurring at the beginning of an epidemic and none during the course, because the disease was not recognized until the development of a fatal complication.

Health departments should offer every facility to physicians for the diagnosis and treatment of diphtheria cases. If a local bacteriologist is not available, cultures should be sent to the laboratory maintained by the State Department of Health for this purpose. A fund should be set apart for the

purchase of antitoxin for indigent persons, and its early use in adequate doses should be insisted upon. Intelligent isolation of cases and contacts should be insisted upon, and dismissal allowed only on bacteriological evidence. By using these measures and insisting upon prompt reports from physicians and heads of families, the prevalence of diphtheria may be materially lessened. Teachers should be instructed to co-operate with the health officer and to refuse to admit children who have been absent for more than three days except upon a certificate from the health officer. The latter should make a careful study of the source and environment of each reported case in order to prevent a further spread and to enforce reasonable isolation and quarantine. The most important measures for the prevention of diphtheria morbidity and mortality are first:

1. Securing prompt and accurate reports of all cases.
2. Early use of antitoxin in adequate doses for treatment, and also for immunizing exposures.
3. Bacteriological measures for detection of cases, carriers and for dismissal of cases and exposures.
4. Physical supervision of school children.
5. Intensive study of all cases by the health officer or an epidemiologist. So little is known about the prevention of many diseases, that health officials should utilize every scrap of knowledge accumulated, and in the case of such preventable diseases as diphtheria, use all known measures in order to save life and to demonstrate the value of preventive medicines.

* * *

Fighting White Plague—and Winning.

The fight against tuberculosis in the United States is bearing fruit. In 1900 there were 2,102 death from phthisis for every million of people. In 1913 there were 1476 deaths to the million.

On the basis of a population of 100,000,000, the details in 1913 (the latest figures available), were 147,600 mostly men and women in the prime of life. If the death rate had been continued, as in 1900, there would have been 201,200 deaths. This means that 53,600 lives were saved.

Iowa has led all the states in its campaign against the white plague. And there is no doubt that the intense interest taken in the war against consumption in Iowa and other states, not only by the physicians, but by the general public, has been the principal factor in reducing the death loss.

But the great white plague still has an awful grip on the nation.

With 147,600 dying in a single year from an entirely preventable disease there is still much work to do. Every agency that has for its object the intelligent fighting of the disease should receive encouragement. Nor should it be left to the efforts of private charity.

Tuberculosis is a disease that menaces the life of every citizen of the country and its elimination is strictly a matter that should have public attention.

The national government, state governments, city, county, village and township governments should do their part to help the sick and to protect the well.

In that way and that way alone can the plague be effectually handled, and eternally whipped.

White Plague Losing Grip in Ohio.

The death rate from the white plague among women has been reduced over 17 per cent in Ohio during the last five years, according to figures made public by the Ohio Bureau of Vital Statistics. This reduction has lowered the general death rate from this disease 10 per cent, a remarkable showing. However, the death rate from tuberculosis among men and children has not decreased.

Why the death rate has remained practically steadfast among the adult males is a question that is puzzling both the state board of health and sociological students.

The following table shows the number of deaths in Ohio from the white plague during the last half decade:

<i>Year.</i>	<i>Total deaths.</i>	<i>Males.</i>	<i>Females.</i>	<i>Males.</i> Under 15.	<i>Females.</i> Under 15.
1910	97,17	3,430	3,104	293	352
1911	7,083	3,490	2,034	318	351
1912	6,838	3,416	2,790	302	330
1913	6,670	3,433	2,601	302	334
1914	6,564		(not yet tabulated)		



PUBLIC HEALTH ACTIVITIES IN OHIO.

Public Health Organizations.

The Ashtabula County Public Health League was formed September 21st. This is a permanent organization succeeding a temporary one formed earlier in the year. The officers of the new League are, president, W. S. King, Ashtabula; vice-president, W. Leet, Conneaut; secretary, Theodore Hall, Ashtabula; treasurer, A. N. Loomis, Jefferson.

Public Health Nurses.

Miss Gertrude R. Steckel, public health nurse at Xenia, resigned September 30th to become superintendent of nurses in The District Tuberculosis Hospital at Springfield. She has been succeeded in Xenia by Miss Clara Mae Dodds, who took up the work October 1st.

Free Clinic for Zanesville.

A tuberculosis and child welfare clinic is to be established in the near future. It will be conducted by Miss Viola Fell, public health nurse, and Miss Sara Coates, a social worker.

Miss Thiel of Zanesville is to assist in the public health nursing work after October 15th.

Tuberculosis Hospitals.

Dr. J. R. Johnson, superintendent of the district tuberculosis hospital at Lima, resigned September 15. After pursuing a special course in Bellevue Hospital, New York City, he will return to Lima and engage in private practice.

Public Health Exhibit.

The public health exhibit of the State Board of Health completed its county fair itinerary October 8th, closing at the Carroll County fair on that date. It has been returned to Columbus for renovation and repair before starting on the fall and winter schedule.

Following is the tentative itinerary arranged for the exhibit. All dates up to January 25-28 have been definitely closed and the balance of the schedule is approaching completion: Byesville, October 19-22; Cambridge, October 26-29; Dayton, November 3-5; New Philadelphia, November 9-12; Kent, November 16-19; Ravenna, November 23-26; Youngstown, November 30 to December 3; Warren, December 7-10; Conneaut, December 14-17; Cleveland, December 21-24, 28-31; Jefferson, January 4-7; Ashtabula, January 11-14;

Chardon, January 18-21; Elyria, January 25-28; Norwalk, February 1-4; Bellevue, February 8-11; Tiffin, February 15-18; Fremont, February 22-25; Port Clinton, February 29 to March 3; Toledo, March 7-10; Bowling Green, March 14-17; Upper Sandusky, March 21-24; Mount Gilead, March 28-31; Columbus, April 4.

Public Health Section for State Charities Conference.

As a result of efforts extending over a long period, public health workers have at last succeeded in having a section devoted exclusively to public health matters included in the program of the State Conference of Charities and Corrections, which meets in Dayton, November 3-5. It is expected that members of the recently-reformed Ohio Hospital Association will be present in large numbers and that representatives of all public health organizations and visiting nursing associations will be represented. An opportunity is thus offered for all the public health agencies and all social workers interested or engaged in public health work to meet together in the interest of closer co-operation in this field.

The following program for the section on public health has been prepared:

STATE CONFERENCE OF CHARITIES AND CORRECTION.

DAYTON, OHIO, NOVEMBER 3-4-5, 1915.

SECTION ON PUBLIC HEALTH.

Chairman—Robert H. Bishop, Jr., M. D., Cleveland.

Secretary—Robert G. Paterson, Ph. D., Columbus.

Suggested Program.

General Session Thursday, November 4, at 8:00.

Blinn Morse, M. D., Detroit, Mich.

Section Meetings.

Wednesday, November 3, at 2:30 P. M.

Hospitals—A Community Asset.

10 min. In charge of A. R. Warner, M. D.,
Superintendent, Lakeside Hospital,
Cleveland..

20 min. A Municipal General Hospital.
Howell Wright,
Superintendent City Hospital,
Cleveland.

20 min. General Tuberculosis Hospital.
A. C. Bachmeyer, M. D.,
Superintendent, Municipal Tuberculosis Hospital,
Cincinnati.

20 min. The Ohio State Sanatorium.
S. A. Douglass, M. D.,
Superintendent, Ohio State Sanatorium,
Mt. Vernon.

Discussion—Dr. J. C. M. Floyd, Steubenville.

Thursday, November 4, at 9:00 A. M.

Nursing.

- 10 min. In charge of Helena R. Stewart, R. N.,
State Supervising Nurse,
Ohio State Board of Health.
- 20 min. The Advantages of a State System.
Ella P. Crandall,
Executive Secretary,
National Organization for Public Health Nursing,
New York, N. Y.
- 20 min. Public Health Nursing in a Local Community in Its Relation to
State Work.
Miss Edna L. Foley,
Superintendent of the Visiting Nurse Association,
Chicago.
- 20 min. Opportunities for Public Health Nurses to Aid in the Prevention
of Blindness.
Miss Carolyn Van Blarcom,
Secretary, National Committee for the Prevention of Blind-
ness, New York.
- Discussion — Miss Elizabeth Holt,
Superintendent of Public Health Nurses,
Dayton, Ohio.

Friday, November 5, at 9:00 A. M.

Social Service.

- 10 min. In charge of J. C. M. Floyd, M. D.,
Steubenville.
- 20 min. Children's Bureau —
C. V. Williams,
Director, Children's Bureau,
State Board of Charities,
Columbus, Ohio.
- 20 min. Child Hygiene,
Frances Hollingshead, M. D.,
Director, Division of Child Hygiene,
Ohio State Board of Health.
- 20 min. Juvenile Research,
Thomas L. Haines, Ph. D., M. D.,
Director, Bureau of Juvenile Research,
State Board of Administration.

Mississippi Valley Conference on Tuberculosis.

With 711 registered delegates present from fifteen states, the third session of the Mississippi Valley Conference on Tuberculosis was held in Indianapolis, September 29 to October 2. A luncheon for Ohio delegates, held Thursday, was attended by 39 persons. This state was also represented on the program by Dr. R. G. Paterson, Director of the Division of Public Health Education and Tuberculosis, Ohio State Board of Health; Dr. J. H. J. Upham, Columbus; Dr. R. H. Bishop, secretary, Cleveland Anti-Tuberculosis League;

Dr. Kennon Durham, director of Tuberculosis Clinic, Medical Department, University of Cincinnati; Miss Charlotte Ludwig, R. N., superintendent of nurses, Department of Public Welfare, Cleveland.

The other states included in this conference are Arkansas, Colorado, Idaho, Illinois, Indiana, Kansas, Kentucky, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Tennessee, Wisconsin, and Wyoming.

The new Central Council of the Conference is composed of Walter D. Thurber, Indianapolis, president; Dr. Dunning S. Wilson, Louisville, Kentucky, secretary-treasurer; Courtenay Dinwiddie, Cincinnati, Ohio; Dr. Walter J. Marckley, Minneapolis, Minnesota; Dr. Ethan Gray, Chicago, Illinois; Miss Carol F. Walton, Ann Arbor, Michigan; A. W. Jones, Jr., St. Louis, Missouri.

The next session of the conference will be held in Louisville, Kentucky, 1916.

"Oral Hygiene Week" in Cincinnati.

"Oral Hygiene Week" is to be observed in Cincinnati the last week in October. The purpose of its observance is explained in the bulletin of the Cincinnati Board of Health as follows:

"The members of the Cincinnati Dental Society are making arrangements for a very extensive program for the last week in October, in the nature of an oral hygiene campaign. There will be no gathering of funds; there will be no personal advertising; there will be no medical or dental buncombe, but there will be a week of awakened tooth consciousness, lecture and talk, stereopticon and movie. Dr. Harvey Wiley and a generous supply of brushes will all play an important role in driving home the value of sound teeth and clean mouths."

Maternity Boarding House Inspections.

On account of the close relation between maternity boarding house inspection and the prevention of blindness, the work of inspecting these institutions, transferred to the Division of Public Health Education and Tuberculosis, August 15, has been put in charge of Miss Rose M. Foster, who began her duties as public health nurse in prevention of blindness work September 1st.

Nine inspections were made during the month as follows: Dayton, two private homes, to inquire as to whether or not they were licensed, and the Door of Hope Maternity Boarding Home, with a view to obtaining a license; Springfield, The Samaria Rescue Home, applicant for license; Columbus, Mrs. Zelia Briggaman's Baby Boarding Home and Mrs. Mary Kidd's Boarding Home (both licensed), were inspected, and Mrs. Myrtle Siemer's home inspected with a view to granting of license; Toledo, The Maternity and Children's Hospital and Lida Bower's Maternity Home were inspected.

Statistics Show Ohio Health Conditions.

Deaths from all causes totaled 65,078 in Ohio last year, as compared with 68,399 in 1913, figures compiled by Dr. M. W. Bland, State Registrar of Vital Statistics, show. The state's death rate accordingly dropped from 13.78 per thousand of population to 12.94.

Ohioans should not flatter themselves, however, that the salubrity of the climate has been increased or sanitary conditions improved. They shouldn't forget that the great flood of 1913 caused immediate deaths numbering 440 and was directly and indirectly responsible for probably 1,500 or 2,000 more. In fact, many deaths in 1914 are believed to have resulted from exposure, contagion and nervous shock caused by the floods of the year before.

All of the contagious diseases show a big falling off in number of victims, the rate per 1,000 for diphtheria dropping from 21.17 to 15.42. The death rate for scarlet fever fell from 6.53 to 4.56.

Typhoid fever also became less fatal, the rate falling from 23.99 to 18.14.

Tuberculosis in its various forms is still far the most prolific cause of death in Ohio, although the rate decreased from 132.34 to 130.58. The total number of victims fell from 6,764 in 1913 to 6,564 in 1914, a decrease of just 200. Pulmonary tuberculosis, affecting the lungs, slightly increased its fatal work, however, the rate rising from 110.63 to 110.96, and the number of victims from 4,593 to 5,578.

As for the larger cities of the state, Canton and Springfield appear to be much more healthful human habitats than any of the others. Cincinnati, Columbus and Cleveland rank next, while Dayton, Toledo, Youngstown and Akron fall into the least healthful class.

Canton, with a death rate of 76.9 for pulmonary tuberculosis and 87.1 for all classes of tuberculosis, is lower than any of her sister cities of more than 50,000 population. Cincinnati's rate in both these classes is the highest, being 216 per thousand for pulmonary tuberculosis and 246 per thousand for tuberculosis in all forms. Cleveland's rate is 112.5 and 134.9, respectively, while Akron's is 78.5 and 97.1; Youngstown's, 90.8 and 112.2; Springfield's, 102.7 and 114.6; Dayton's, 115.5 and 128.6; Toledo's, 162.4 and 183.9, and Columbus', 132.9 and 165.6.

Cincinnati is lowest in its typhoid death rate with 6. Youngstown's is highest with 42.7; Cleveland's is 8.2; Columbus', 13.2; Toledo's, 37.3; Dayton's, 10.8; Youngstown's, 42.7; Akron's, 31.1; Canton's, 15.4, and Springfield's, 21.7.

Columbus is the lowest in diphtheria death rate list with 7.8, while Cleveland is highest with 25.4. Dayton's rate is 10.9, Cincinnati's rate is 18.

Canton and Springfield have a record of no deaths at all from scarlet fever in 1914. Akron has the highest rate, 8.7. Cleveland's rate is 7.3; Cincinnati's, 4.8, and Dayton's 6.4.

Boys' Health Clubs.

SHOULD BE ORGANIZED IN ALL SCHOOLS, SAYS DR. PETERS.

Organization of Boys' Health Clubs to promote personal and community hygiene is the suggestion made by Assistant Health Officer Peters, of Cincinnati, in a letter addressed to the principals of public and parochial schools.

Dr. Peters also suggests a special study of children who were not promoted to a higher grade last year to ascertain if there is any mental weakness that resulted in their failure. He urges that children who have been absent from school for four consecutive days should be referred to the district physician for examination before they are permitted to return to their classes. Experience in the past, he says, has demonstrated the wisdom of this procedure.

Death Clears "Pen's" Tuberculosis Ward.

For the first time in years the tuberculosis ward at the pen is empty. Its last patient, William Torance, colored, from Hamilton County for manslaughter, died Wednesday.

"The penitentiary always has had this disease to fight," said Warden Thomas, Thursday.

"At times there were as many as 25 or 30 in the ward. But due to the trusty system, by which men are permitted to work in the open air on state farms, the number has been cut down in recent years until today the ward is empty."



CURRENT COMMENT ON MATTERS OF PUBLIC HEALTH AND SANITATION.

The Practical Use of Disinfectants.

In a recent number of Public Health Reports, H. E. Hasseltine, Past Assistant Surgeon of the United States Public Health Service published an interesting paper on the use of disinfectants. The writer tells us that for many years man was ignorant of the organisms causing disease, and only after bacteria were discovered was a means of defense sought. Heat and sulfur were formerly used by the ancients after dangerous diseases, but in the early eighties the real purpose of disinfection became apparent. The terms disinfection and fumigation are frequently used synonymously, but in reality disinfection means to free from infectious or contagious matter, while fumigation is the act of applying smoke, gas or vapor. When the hold of a vessel is filled with sulphur dioxide or hydrocyanic gas for destroying rats, mosquitoes, or other animal carriers of disease, it is said to be fumigated, but is not disinfected. If sufficient moisture has been added with the sulphur dioxide, the gas then becomes a disinfectant vapor and acts upon the bacteria present. It has been established beyond a doubt that the multiplication of bacteria depends upon environment. If the conditions are unfavorable, the death rate may exceed the rate of increase, and if the condition remains unfavorable, total extinction of the organisms results. Thus it is thought that when unfavorable conditions exist, if we wait long enough, environment may act as a natural disinfectant. The term disinfection is applied to that process by which we increase the death rate of organisms in order to exterminate them more rapidly than is possible by natural processes. There are really two general periods at which disinfection should be done. The first is during the course of the disease and the second is after the case has terminated either in recovery or death or removal to other quarters.

Disinfection during the course of the disease is very important, and if such measures are properly instituted the necessity for terminal disinfection is greatly lessened. Since the patient is the source of the infection, it is necessary that disinfection should take place at the bedside or in the sick room. Since organisms are common in all the excretions, the urine, feces, sputum and vomits should be properly disinfected, as should also the linen, bedding, dishes and other utensils which come in contact with the patient. The excretions of the body should be received on cheap fabrics and at once destroyed. Dishes, towels, and toilet articles should be cleansed by boiling. In order that this disinfection be done properly, it should be intrusted to a trained nurse or some member of the family should be given proper instructions. No disinfectant to be used at the bedside is ideal, and aside from heat, solutions of 5 per cent phenol, 1 per cent trikresol and other similar disinfectants are most effective. For feces and urine when other agents are not obtainable water may be allowed to stand until the bacteria are practically all destroyed. Milk of lime is also another good disinfectant for these excretions. Bath water used by a patient is easily disinfected by the application of heat, or by the addition of crude carbolic acid. Bedding may be boiled or soaked in five per cent carbolic acid for two hours. Mattresses may be subjected to steam under pressure.

There is a difference of opinion among health authorities in regard to terminal disinfection. However, all agree that disinfection is necessary after any unusual or rare infectious disease, such as cholera, if found in the community. Many authorities feel that terminal disinfection is unnecessary after the common infectious diseases such as diphtheria, scarlet fever, whooping cough, etc. They feel that after being discharged from the patient's body the unfavorable conditions for their multiplication soon annihilate the organisms. In 1912 the New York City Health Department abandoned terminal disinfection after the common infectious diseases, and it is claimed that the morbidity rates from these diseases were not increased. However, it is possible that disinfection before 1912 did not destroy the organisms even though they were careful in the technique of this infection. Thorough cleaning of the room after the recovery from the infectious disease is supposed to be almost as efficient in removing the source of infection as fumigation. Since dust or droplets always settle and the law of gravity is always in effect it is possible that most of the infection will be found near the floor of a room, and if the floors are properly scrubbed and particular attention is given to the window ledges and casements, it is evident that a thorough mechanical cleansing will do much good. Drying and exposure to light is another means of destroying infectious organisms, but tests have shown that many organisms are not easily killed in this manner. Most writers agree that even though disinfection is not as efficient as could be desired, yet if only a small number of cases are avoided by disinfection, it is still worth while. In combating a disease which is carried by animal hosts, the use of sulphur dioxide is the best means of fumigation. Five pounds of sulphur for each thousand cubic feet should be permitted to burn, and the exposure should last from four to twelve hours. Hydrocyanic gas may be used but it is more dangerous to man. For the common infectious diseases formaldehyde gas still holds first place, and its germicidal effect when properly applied is not denied. To accomplish proper results formaldehyde should never be used when the temperature is less than 65° F., or the relative humidity is less than 65 per cent. The temperature of the room can easily be raised to 65° and the humidity may be raised by boiling water in the room. Many means of liberating the formaldehyde gas have been tried, but since the action of formaldehyde and permanganate of potash is so rapid and the humidity of the room is also raised as this action progresses, it is thought that the formalin-permanganate method gives the best results. For 1,000 cubic feet of space ten ounces of formalin and five ounces of potassium permanganate should be used. The permanganate should be placed in a container and the formalin poured over it. Favorable results have also been obtained by the use of sodium dichromate and sulphuric acid, together with formaldehyde solution in the following proportions:

Sodium dichromate	10 ozs.
Saturated solution formaldehyde gas.....	1 pint
Commercial sulphuric acid.....	1½ ozs.

The acid and the formaldehyde solution are mixed and allowed to cool, and this solution is then poured over the crystals of the sodium dichromate which have been spread in a thin layer in a large container.

The writer briefly summarizes the article as follows:

1. Proper disinfection, and prevention of communicable diseases.
2. The efficiency of disinfection decreases with the distance between the patient and the point of application of the disinfectant.

3. Natural disinfection increases in efficiency in proportion to the length of time and the degree to which drying, sunlight, etc. are allowed to act.

4. Terminal disinfection should not be discontinued until natural disinfection is found to be more complete.

5. General conditions must be considered in choosing a disinfectant, remembering, however, that a thorough chemical cleansing is of great importance. Under proper conditions of moisture and temperature the formalin permanganate method is the simplest and most efficient.

6. The efficiency of disinfection should be based by control tests.

7. Though the results obtained in some cities since abandoning terminal disinfection after certain diseases seem to show that heretofore much useless disinfection has been done, it is not felt that the evidence thus far adduced, fully justifies its discontinuance. — *Abs. Public Health Reports, 1915.*

Medical Inspection of Open Air Schools.

Open air schools were introduced in America about 1908, and since that time the number has increased until they are found in all large cities. Since these schools differ from the ordinary school, so also does the system of medical inspection differ in many respects. In one of the large open air schools of Rochester, N. Y., it was found desirable to have special medical inspection for the open air school, aside from that of the public schools. This special inspection was provided by the Rochester Public Health Association, which also maintains a general dispensary. By this means, only suitable children are admitted to the open air school, and after their admission they become a patient as well as a scholar. Since this school has been in this manner separated from the public schools, the parents of children must follow out the instructions of the medical directors or else send their children to the public schools. In this system of medical inspection a regular routine is followed. All applications for admission are made at the association building where the applicant is examined and suitable recommendations in regard to dental work, removal of adenoids and tonsils, treatment of skin conditions, and similar abnormalities are made. If these instructions are properly carried out, the child is placed on the waiting list and will be admitted. Otherwise, he never becomes a pupil of the open air school.

Aside from the examining physician there is also a nurse who visits the home and makes a report in regard to food, sleeping quarters, financial conditions and other matters which may affect the children's welfare. In order to keep this data properly tabulated, two cards are kept for each child. On one side of the first card is the name, date of birth, nationality, address, age, sex, school, grade, date of admission, the name of the examining physician, diagnosis, and the principal. The remainder of the card is divided into two columns. In one column is recorded the family history, including that of the father, mother, brothers and sisters, in order to ascertain the prevalence of hereditary diseases or injurious habits. The other column is used for physical examination, under which the following are mentioned: General appearance, nourishment, deformities, spinal curvatures, skin, mucous membranes, eyes, ears, nose, throat, tongue, teeth, heart, blood vessels, chest and lungs, abdomen, urine, sputum, etc. On the back of this card are columns for

the monthly notation of temperature, pulse, respiration, weight, height, chest, hemoglobin and remarks.

The front of the notification report card indicates conditions found at the homes of the applicants, while the back of the card is ruled into twelve lines, showing the following monthly notations. Summary of visits: sick, co-operative, primary and subsequent; remarks; days absent.

After admission the attending nurse bathes each child once a week and records the temperature, pulse, weight and chest expansion. The hemoglobin is reported twice a year. Once each month each child is examined by the physician. The patient is stripped to the waist and a general examination made. By reference to the cards the examiner can very readily note any marked changes which have occurred since the previous examination. Occasionally special attention is given to certain groups of diseases, and at such time specialists along these lines are called in consultation with the examining physician. The nurse in charge makes note of any recommendations and confers with the mother and the family physician, or else if there be no family physician, accompanies the child to the dispensary. Unless the family physician advises against the measures recommended, the advice of the attending physician has to be followed, or the child is dismissed from the school. While the above tables and examinations are quite complete they are considered very necessary since many children are abnormal or are taken from homes where disease exists. Many children affected with anemia, cardiac disease, malnutrition, etc., require further examination and close attention. To do this work properly a physician should be able to devote several hours a week to school inspection. At the present time one nurse devotes five forenoons each week in order to care for sixty children, while the physician averages about three hours a week at the school.

Aside from physical examination, the physician also makes frequent inspections of the buildings and rooms and offers valuable suggestions in regard to exercise, clothing, food, and other hygienic matters.—*Abs. Journal A. M. A.*, 1915.

Danger in Sun Baths.

Many persons who enjoy bathing and sun baths feel that they would be much benefited by a vacation spent in this manner. However, according to a recent article in the Journal of the American Medical Association, persons who are not accustomed to such exposures are apt to be injured by excessive exposure to the bright rays of the sun.

At popular bathing beaches bathers spend hours each day basking in the sun. At a Hamburg beach 18,000 persons were taking a sun bath on a single day. According to recent investigations severe headaches and even meningitis have resulted. Nervous persons are said to be especially susceptible to injurious effects of too much sun light. Instead of being benefited, such persons are made more nervous and return to work in poorer condition than before taking their vacation.

Experts on heliotherapy maintain that only a small part of the body should be exposed to the sun's rays daily and that the amount of surface exposed and the length of exposures should be gradually increased according to needs of the individual.

While it is true that many persons are not noticeably injured, yet it is advisable for all persons to exercise great care in taking prolonged and frequent sun baths.—*Abs. J. A. M. A.*, 1915.

How to Get Sick.

SIMPLE RULES GUARANTEED TO KEEP A STRONG MAN OR EVEN A WOMAN SICK.

Here are a few simple, certain, dead easy ways of getting sick. They are guaranteed to produce results or you get your money back. If you don't believe it, try them once.

By hurrying through your meals and gulping down a lot of poorly cooked, unchewed "brick-bats and mortar" by way of soggy biscuits and fat meat that would defy a goat's stomach.

By never smiling at meals but by wearing a grouch and trying to make the rest of the family miserable.

By over eating and under exercise, by constipation, intemperance and excesses, by everlasting hurrying, worrying, fretting, stewing and straining to keep up appearances.

By sleeping with the windows closed and by staying in doors all the time.

By drawing more out of your physical and nervous bank account every day than you restore.

By always reading medical books, medical ads., and trying to diagnose your own case, especially if you didn't have any case to start with.

By taking every old medicine recommended by your friends and neighbors.

By telling everybody else how badly you feel and trying to outpoint them in their petty ailments.

By enjoying poor health—yes, just that. There are a few people one occasionally meets who really enjoy poor health. They feel badly when they feel good because they are just sure they are going to feel worse afterward. Are you one of them?—*North Carolina Bulletin*, 1915.

How to Drink from a Bubbling Fountain.

"BITE THE BUBBLE."

If improperly constructed or improperly used, the bubbling drinking fountain may be a greater menace to health than the common drinking cup. The other day an inspector of the U. S. Public Health Service took a seat beside a bubbling drinking fountain in a railway station and watched the way in which it was used. Forty seven different persons, of whom 11 were men, 23 were women, and 14 were children, used the bubbling fountain. In almost every case the lips were placed almost completely around the metal ball from which the water spurted, and one small boy seemed as if he were trying to swallow it. Several of the men obviously were chewing tobacco. Of the 47 people, 4 were colored, 3 looked as though they might have tuberculosis, and 3 had an eruption upon the face.

Every person using the bubbling drinking fountain should bear in mind that the object of this sanitary device is to prevent the interchange of mouth

secretions. When mucous and other matter becomes attached to metal it sometimes requires considerable force to remove it, and this is not always accomplished by a slowly moving current of water. In using the bubbling fountain the rule should be "Bite the Bubble." The lips should not touch any part of the fountain and under no condition should the fountain be used for rinsing the mouth or for expectorating.

Intemperance and Public Health.

IS INTEMPERANCE A MORAL OR A PUBLIC HEALTH QUESTION?

Alcoholic intemperance has come to be regarded by several boards of health, New York City Board of Health in particular, as a public health question rather than a moral. Why? Because they believe alcoholic intemperance to be the direct or contributory cause of an immense amount of sickness and disability and of a very large number of deaths. In this connection, Dr. Frank Crane in an editorial in the *Globe*, says:

"At last the alcoholic question is getting around to the right basis. It is being considered as a matter of public health and not of public morals. It is getting away from the preachers and into the hands of the doctors."

The propaganda proposes to be an educational one. The movement is not intended to moralize on drink generally, nor is it directed against temperate drinkers, but to educate the people up to an understanding of the harm which the intoxicant inflicts upon them, and to give them definite proof of its effect upon the individual. In brief, it is a crusade in the interest of today's children and tomorrow's children who need the fighting chance for health and future citizenship.

Probably, to the life insurance companies as to no other source is this educational propaganda against alcohol attributable. They have from time to time borne striking testimony as to the influence of the use of alcoholic beverages on mortality. Forty-three of the leading life insurance companies in the United States and Canada have prepared their collective experience which embraces about 2,000,000 lives for a period of twenty-five years. It is the largest and most comprehensive investigation ever undertaken by insurance companies in the world. The object of the investigations was not to excite public interest or curiosity but for actual use in a great business, to determine from past experience the types of lives among which the companies had a higher mortality than the average. Their findings were the occasional or moderate drinker's extra mortality was equivalent to a reduction of over four years in the average life of this class and that the greater the indulgence the greater came to be the mortality.—*North Carolina Bulletin*, 1915.

Appropriations for Public Health Work in Pennsylvania.

Pennsylvania has appropriated \$4,632,387 for public health work in the State during the next two years. Of this amount, \$2,975,807 is for tuberculosis work. If the State officer of health for Pennsylvania does not make a showing with this amount of money at his disposal he is unfit for the high office he holds. Incidentally the liberality of the Pennsylvania lawmaking body is a good example for other states that do not appreciate the economic value of public health work.—*The Lancet-Clinic*, 1915.

Garment Workers' Health.

U. S. PUBLIC HEALTH SERVICE REPORTS ON HEALTH OF WORKERS AND HYGIENIC CONDITIONS OF ILLUMINATION OF GARMENT SHOPS.

The United States Public Health Service today issues Public Health Bulletin No. 71, a report upon the health of garment workers. This is the first of a series of studies of the effect of industries upon the health of the individual worker, and was undertaken in the women's garment industries of New York City during the summer of 1914. The Joint Board of Sanitary Control of the industries in question and the various labor unions concerned joined in requesting this study and co-operated in its performance.

THREE THOUSAND WORKERS EXAMINED.

Two thousand male workers and one thousand female workers volunteered for careful physical examinations by officers of the U. S. Public Health Service. Only about 2 per cent. of the total number examined were found free from defect or disease, there being recorded 13,457 defects of all kinds of which 9,451 were in males, 3,916 in females, or an average of 4.36 defects and diseases to each individual examined. While not all of these were serious defects, many of the conditions noted exercised a deleterious effect upon the individual. An interesting feature of the report is that there were discovered no vocational diseases peculiar to the garment trades, but this sedentary industry was shown to intensify the bad effects upon health and efficiency of certain defects and diseases.

PREVALENCE OF TUBERCULOSIS.

Among males the rate of prevalence of tuberculosis was found to be ten times that in the United States Army, and three times the Army rate among females. The disease was most prevalent among the lowest paid class of workers.

DEFECTIVE VISION COMMON.

Apart from tuberculosis, the most common defects and diseases noted among the garment workers were defective vision, 69 per cent; faulty posture, 50 per cent of males; chronic nose and throat affections, 26.2 per cent; defective teeth, 26 per cent; pyorrhea alveolaris, 20 per cent; weak and flat feet, 26 per cent; chronic constipation, 23.7 per cent; hypertrophied tonsils, 15.3 per cent; defective hearing, 10 per cent; and nervous affections, 7.75 per cent. Only 11½ per cent of those with subnormal eyesight wore glasses, and but 2.35 per cent of these had glasses which fully corrected the defect.

FAULTY POSTURES.

The report which the United State Public Health Service is just issuing shows that faulty postures were very common among the garment workers. The effect of previous military training received by foreign-born garment workers in European armies, or the voluntary physical training in other workers, were marked in preventing the formation of poor postural habits.

The conclusion reached by the investigators is "that a large part of the defects and diseases of garment workers arise from ignorance or neglect of personal hygiene. A proper regard of these principles on the part of the workers

would go far in nullifying the bad effects of the sedentary indoor occupation upon the health." In this connection the recommendation is made that the education of the workers in personal hygiene, especially the correction of visual defects, the formation of correct postural habits and attention to oral hygiene, will do much to correct this condition. The report points out the necessity for better instruction of school children in personal hygiene and the necessity for postural training is insisted upon.

ILLUMINATION OF GARMENT WORKSHOPS.

In 34 workshops careful measurements were made of the light at the stations of the workers, and it was found that the illumination was inadequate at a little over one-half of all the stations, some 1,800 in all, at which the workers were located. Common defects noted were poor arrangement of working stations with reference to windows, reduction of available natural illumination by the use of unnecessary opaque partitions, neglect to clean windows, obstruction of windows by piles of garments, the use of clear, unshaded lamps, the use of saucer and disk reflectors for local illumination, the use of lamps too large for the reflectors employed, dirty reflectors and lamps, too high or too low suspension of lamps, lamps missing, blackened, burned out or short-circuited, the use of a few large instead of a greater number of smaller units for local illumination, and lack of uniformity in the distribution of light upon stations where workers are located.

The Public Health Service is engaged in making similar investigations with regard to other trades, and will issue similar reports at subsequent times.

The Significance of *Bacillus Coli* in Pasteurized Milk.

Whenever colon bacilli or other non-sporulating gas-producing organisms are found in pasteurized milk, it is usually thought that the milk has been improperly pasteurized, or has been subsequently contaminated. It was formerly claimed that these organisms were killed by ordinary pasteurization, but recent investigations indicate that certain strains of *B. coli* are able to survive 65 to 67° C. (149 to 152.6 F.) for thirty minutes. Since these strains would not be killed by ordinary pasteurization, the organisms would still be found in pasteurized milk.

In order to further test this assertion, a number of samples of milk collected in Baltimore, Maryland, were examined. In all but one sample aerobic non-sporulating organisms were isolated. Thirty-one different strains or aerobic gas-producing organisms were isolated and the thermal death point of each strain recorded. Eleven of the thirty-one strains possessed a death point above 60° C. for fifteen minutes. Three of these survived 63° C. for thirty minutes and three others survived 62° C. for the same time. The most resistant strain which was identified as the *B. Coli* communior, died at a temperature of 68° C. for fifteen minutes and 65° for thirty minutes. The highest thermal death point of *B. Cloacae* was found to be 64° C. for fifteen minutes or 62° C. for thirty minutes.

All cultures of *Bact. aerogenes* were destroyed by a temperature of 60° C. for fifteen minutes. From these experiments it is evident that certain

strains of *B. Coli* are not killed by the temperature commonly used in pasteurization, and that the thermal death point varies for different strains of the same organism. This variation in temperature may be as much as thirteen degrees.—*Abs. J. A. M. A.* 1915.

How Shall Milk Be Rated.

There has been much discussion recently regarding the best means of grading the quality of market milk. There are four chief requirements which should be satisfactorily fulfilled by desirable milk: (1) it should have a satisfactory food value; (2) should be free from visible dirt and any unpleasant odor or taste; (3) should not contain an excessive number of bacteria; (4) should not contain pathogenic organisms.

Of late years, the number and character of the bacteria in milk is considered of more importance than a chemical analysis of the market milk. Many systems of "scoring" dairies have been tried in various communities and have met with much success. However, a good score card does not insure a milk of high quality. For this reason any satisfactory grading will have to include both the dairy score and the quality of the milk produced. As soon as a satisfactory score card has been arranged the grading of dairies will be more satisfactory and dairymen will endeavor to produce clean, pure milk. It has been demonstrated that intelligent dairymen can produce high grade milk anywhere and with very simple equipment. Clean, high grade milk, at a moderate cost of production, is the object to be attained and the system of grading should be formulated with that end in view.—*Abst. J. A. M. A.*, 1915.

The Improvement of the Milk Supply.

From the public health standpoint it is desirable that the milk supply should be pure, nutritive and cheap. Encouraging results in all these particulars have lately been secured in various parts of the world.

Pure Milk. The impurity of milk increases with the number of its handlings. For this reason the milk produced in town dairies is sometimes less impure than that produced in the country. Figures from Boston show that the greater the delay in transit, the larger the number of bacteria. The first essential in securing pure milk is to see that all milch cows are healthy. A large number are at present afflicted with tuberculosis. Next there must be clean surroundings, as experiment has shown that sprinkling the bedding, washing the cows flanks, discarding first strippings and using closed pails will reduce the bacterial content materially. The separator will also rid the milk of much dirt. In shipping the milk a can which has the rim of the mouth completely covered should be used. All railway cans should be sealed. Finally in delivering the milk only the bottle method should be tolerated.

Richer Milk. The present standard of butter fat in this country is three per cent. and there is no reason why it should not ultimately become four per cent. This would be desirable. At the present time milk is not sold according to quality but quantity and it is actually more profitable for a dairyman to keep cows which give large quantities of inferior milk than to keep cows which give

milk of high quality. Certain breeds of cows will always give milk of high quality and others will constantly give milk with a low butterfat content. Feeding seems to have no effect on the quantity of butterfat produced. Milkmen who supply milk to the Dunlop Dairy Association of Glasgow are fined if the milk has a lower percentage of butterfat than four, and rewarded if the percentage is higher. None of the milk has a lower percentage of butterfat than four at present. In Vancouver, B. C., the dairies are scored and the results published monthly. In this way the germ of competition is instilled and the milk is improved without legislative action. In the matter of raising the quality of the milk the town of Geneva, N. Y., was the seat of an interesting experiment. A system of dairy inspection was inaugurated in 1907 whereby each dairy was scored and a duplicate score card given to the dairyman. At the first inspection only five per cent. of the dairies were scored as good, and the remainder medium and poor. A year later 9 per cent. were excellent, 59 per cent. good, and 38 per cent. medium. None were marked poor.

Cheaper Milk. A higher price for milk produced under the best conditions is inevitable. Clearing the air of the barn with steam, vacuum cleaning the cows, sterilizing the cans, filtering the air in the cooler, packing the final container in ice, and finally conveying the milk to the city by motor, these are all processes which must of necessity enhance the price of milk. Another reason for the high price of milk is unrestricted competition. A German writer has suggested municipal control of the milk supply. Another method of solving the problem of ruinous competition is to organize the producers, as in the case of the Dunlop Association which has been extremely successful in raising the quality of the milk.—*Abst. Journal of State Medicine*, 1915.

Humanized Milk in Infant Feeding.

That mother's milk is the best food for her infant has been proven beyond all doubt, but it sometimes becomes necessary to substitute cow's milk for mother's milk either occasionally or continuously. If all mothers were able to nurse their infants, the great study of pediatrics would be of much less importance. But since this cannot always be done the study of pediatrics is becoming more and more prominent. Whenever the supply of mother's milk becomes inadequate, cow's milk more or less modified is usually substituted. The subject of proper modification of cow's milk has been much discussed. Although each pediatricist claims good results with his particular method, yet there has never been a definite standard which would give satisfactory results.

Artificial feeding may be divided in three parts, namely: the feeding of healthy infants; the feeding of infants during an acute illness; and the feeding of infants suffering from some chronic digestive disability. In order to feed the sick infant, the case has to be studied and the modifications of the milk be adapted to the needs of the little patient. To feed the healthy infant there are two methods: the one is a simple dilution of the whole milk, and the other is the percentage feeding. The simple dilution of whole milk is quite often satisfactory but when this milk is compared to mother's milk it is found that the child does not receive those food products which are necessary for its proper development. The percentage method of feeding is scientific and if the milk is properly prepared this method is quite satisfactory, but the process is so complex

that in many instances healthy infants are made ill by improper modification of the milk.

Humanized milk is cow's milk which has been modified until it contains the same constituents as mother's milk in almost the same proportions. The following is a simple method of preparing humanized milk. The upper 15 ozs. of a quart of milk which has been kept for six hours at a temperature of from 40 to 50° F. has the following percentage composition:

Protein	3.40
Sugar	4.50
Fat	8.00
Salts	0.70
Water	83.40

When this upper 15 ounces is diluted with an equal volume of water it gives the following percentages:

Protein	1.70
Sugar	2.25
Fat	4.00
Salts	0.35
Water	91.70

This very nearly approaches mother's milk except that the percentage of sugar is low and when sugar has been added to make 7 per cent the following comparison to mother's milk results:

	<i>Mother's Milk.</i>	<i>Humanized Milk.</i>
Protein	1.50	1.70
Sugar	7.00	7.00
Fat	4.00	4.00
Salts	0.20	2.35
Water	87.30	86.95

To prepare this milk, the mother or nurse after deciding the number of ounces at each feeding and the number of feedings per day, takes the upper 15 ounces of one or two quart bottles of milk and adds an equal number of ounces of cooled polluted water. To this is added enough of the milk sugar to make the 7 per cent as required, and the whole is then ready to be divided into the feedings necessary for the day. Even though humanized milk very closely approximates the mother's milk in constituents and proportions, yet there are still economic and biological differences which cannot be overcome, and for this reason it should not be used where mother's milk is available. Nor is it intended to replace the more scientific modification of milk by the percentage methods, but it is a simple method of obtaining a very good modification of milk for the average healthy infant when a better means is not available.—*Abs. Medical Record, 1915.*

Standards for Determining the Purity of Milk.

THE LIMIT OF ERROR IN BACTERIOLOGICAL MILK ANALYSES.

The Public Health Reports of the U. S. Public Health Service for August 13, 1915, publishes an article by Prof. H. W. Conn, of the Wesleyan University, Middletown, Connecticut, on the discrepancies in the reports of analyses of sup-

posedly identical samples of milk. This report, which is in considerable length, considers whether these discrepancies are due to the inevitable difficulties in bacteriological analyses, and the improvements which may be made in the method of technique of such analyses.

In October, 1914, four of the large laboratories in New York City determined upon a co-operative test by which some of these questions could, if possible, be answered. The planning and co-ordinating of the whole series were in the hands of a referee, and the tests lasted seven months and involved something like 20,000 separate analyses by a variety of methods. The author concludes that the present standard methods of milk analysis are in need of revision; that individual analyses under the best condition are subject to considerable variation so that no single count can be properly relied upon. The article contains nineteen separate conclusions, and will doubtless prove of great value to those interested in the standardization of the purity of milk.

The Municipal Care and Supervision of the Tuberculous.

The purpose of the municipal care and supervision of the tuberculous is twofold:

1. To alleviate the sufferings of the sick and to see that they have comfortable surroundings and proper care.
2. To prevent the spread of the disease.

The municipality may be looked upon as a group of families and each family as a group of individuals. As the well and competent members of a family should care for the sick and incompetent members, so should the well and competent households of the municipality care for the sick and incompetent households when they cannot properly care for themselves. This is the underlying thought which prompts the community to care for its sick and to see that they are provided for.

The first necessity is to know of the existence and the needs of the sick. The occurrence of cases can be ascertained only by having practicing physicians report the cases in their practice to the health department. Having secured information of the tuberculous in the community, their needs can be ascertained by having a competent person visit each case.

In a municipality provision should be made for the following institutions and work in connection with the care and supervision of the tuberculous.

1. Practicing physicians should report to the health department all cases of tuberculosis, or of suspected tuberculosis, found by them among their patients. Others should be encouraged to report suspected cases in their families.
2. A sanatorium for the care of early and advanced cases.
3. Dispensaries for the making of physical examinations and diagnoses, and for the treatment of those cases of tuberculosis suitable for dispensary treatment.
4. A corps of nurses to work in conjunction with the dispensaries, to carry on educational work in the homes, and to supervise the care of patients in the homes.
5. Open air schools for tuberculous children.

The condition and status of tuberculous persons should at all times be known to the health department. The place and kind of work of those occupied should be known.

7. Cognizance should be taken of the physical condition of all members of infected households, especial attention being paid to signs and symptoms of infection in members other than the subject of the central case. Record should be made of the spread of infection in households.

8. All milk sold in a municipality should be from tuberculin tested herds and should be pasteurized.

It is fully as much the duty of the municipality to protect the well from disease as it is to care for the sick. The individual can protect himself in some measure from the communicable diseases of the sick of whom he knows, but he is helpless to protect himself from the sick of whose existence he is unaware. The latter is the function and responsibility of the community.—*Abs. Public Health Reports, 1915.*

Typhoid Fever in the Philippines.

Available statistics indicate that typhoid fever is more prevalent in the Philippines than it was in former years. During 1911 and 1912 the proportion of typhoid fever cases admitted to the general hospital at Manila were fairly uniform when compared to the total admissions. During the first half of the year 1913, there was a marked increase in the number of typhoid cases. This half may be due to the fact that the people are becoming more accustomed to sending their patients to the hospital, or it may be due to a severer type of the disease. However, if typhoid fever once becomes established in the Philippines, the spread of infection is difficult to combat because of the peculiar environment and the poor hygienic conditions under which most of the people live. As in Europe and the United States typhoid fever is more prevalent in the Philippines during the autumn months, continuing in the winter and declining in the spring. It also corresponds in regard to sex and age distribution. Clinically the course of the fever is much the same as in other countries. The temperature is much lower and the fatigium is not so typical. Delirium is not so common, abortive types are more common and rather difficult to diagnose, and relapses frequently occur. Because of these symptoms, in the Philippines each case of continued fever, slow pulse and enlarged spleen should be regarded as a suspicious case of typhoid fever. Hemorrhages have occurred in nearly one-seventh of the cases recorded. Perforation is also common and as a result the mortality rate is comparatively higher. Filipinos seem to have a lowered resistance because of their mode of living and limited diet. Many cases are almost in a hopeless condition when they are admitted to the hospital. It is thought that when the hygienic conditions and the diet of the Filipinos have been improved their resistance will also become greater, and the effects of typhoid infection will not be so marked or the mortality rate so high.—*Abs. J. A. M. A., 1915.*

Typhoid Season at Hand.

U. S. PUBLIC HEALTH SERVICE FORECASTS 200,000 CASES IN SUMMER
AND AUTUMN.

During the year, probably 200,000 people in the United States will contract typhoid fever. The average period of invalidism will be more than a month for every case developing, so that the economic loss, even if recovery does ensue,

can be reckoned upon this basis, including at the same time the care and attention required. Of those who contract the disease, possibly 18,000 will succumb. Fifty per cent of these will be between the ages of 15 and 35 years, the very time of life when the loss is most frightful. Moreover, this is an annual toll and represents the minimum fatality which we have attained. No sooner is the computation of the 18,000 completed than another series is begun, and so on interminably. True there is some diminution in the total number, the death rate since 1900 having been diminished by half, and most of our cities showing a progressive reduction in the incidence of the disease, but it still remains much higher than that of countries which we are apt to consider less civilized than our own.

FINGERS, FLIES AND FILTH.

Typhoid fever is a disease of filth. It can only be contracted by taking into the system the waste products of one previously ill of the disease. These waste products are conveyed from one individual to another usually by means of a third object, such as water, flies or milk. Even if disease itself were never contracted in this manner we should revolt at the abhorrence of the idea of such uncleanness. For every case of the infection developing, some one, either the municipality or the individual, has been careless, and public opinion will soon regard such carelessness as criminal. In the eyes of the health officer typhoid fever is strictly a preventable disease, invariably originating from an antecedent case, and contracted in a most loathsome manner.

TYPHOID FEVER A FACT, NOT A THEORY.

Our scientific knowledge of the disease is most complete. For thirty years the causative organism has been known and studied. Its habitat has been surveyed, the associating organisms classified, and the many facts relating to the life of the bacillus fully recorded. For nearly twenty years we have been in possession of most delicate blood tests for the recognition of the disease, tests which are not only of great diagnostic worth but which should actually assist in the prevention of the infection. Our knowledge of the dissemination of the disease, in both its epidemic and endemic forms, is consequently exact and definite. Not content with accomplishments along these lines the medical profession, in view of the continued morbidity, has even devised methods by which the public may continue to live under insanitary conditions with perfect impunity, so far as this particular disease is concerned. In other words, persons may take into their systems the filth which produces disease and death and yet, if the preventive treatment has been received, apparently remain free from harmful effects.

EIGHTEEN THOUSAND DEATHS PER ANNUM.

In spite of these efforts and accomplishments the frightful mortality continues and the disease this year will again usher 18,000 victims to their graves. Plainly, the practical application of our knowledge is far and away behind the scientific data in our possession, and a large proportion of the population is ignoring the very principles which have been so well established. For this reason, health officers realize that further steps toward prevention must be the result of more general enlightenment and the better education of the mass of the people.

TYPHOID ABOLITION A COMMUNITY MATTER.

The avoidance of the infection rests primarily upon community action. The proper protection of water supplies, the eradication of filth and all its accompaniments, the attainment of a decent standard in the disposal of excrementitious material, the regulation of dairies and the safeguarding of milk are all problems which only communities as a whole can settle. Nevertheless, this does not absolve the individual citizen from responsibility, and he can do much for his own protection.

CLEAN UP!

The eradication of filth is in part the duty of every citizen, and each should see that his own surroundings are in a satisfactory condition. He should guard against carelessness in the maintenance and preparation of food and withhold his patronage from those who disregard the rules of cleanliness, remembering that the foods which are most subject to contamination are milk and its products, oysters and vegetables. The role of flies in the dissemination of the infection is now generally recognized. The elimination of such fly-breeding places as garbage, manure and filth is most essential, but the proper screening of houses and the adoption of destructive measures are also of great prophylactic value. If, in spite of these precautions, the disease develops, it then becomes the duty of every citizen to implicitly follow the instructions given in order that the safety of others may not be imperiled, bearing in mind the fact that every case of typhoid fever is due to some one's ignorance or carelessness. No higher duty of citizenship than this can be conceived.

Typhoid Vaccination Gaining Favor.

An enormous increase in the number of persons seeking anti-typhoid vaccination is reported by the U. S. Public Health Service. Not alone is this increase manifested among the beneficiaries of that organization and government employes, but the general public is also awakening to the value of the inoculation. Reports from physicians throughout the country indicate that many are receiving the preventive treatment and laboratory establishments have had a greatly increased demand for the vaccine. So great is the call among employes of the government that it has been necessary to issue a second edition of the Secretary of the Treasury's circular stating the localities where the treatment may be received. It is estimated that during 1914 over 100,000 persons throughout the country were immunized and it is believed that in 1915 the number will exceed 300,000. In four counties of North Carolina, where campaigns are now being conducted, it is estimated that 20,000 people will be immunized.

The public is seldom slow to accept an innovation of worth. The reduction of the case rate in the Army from 536 per 100,000, before the discovery of anti-typhoid vaccine, to 3, since inoculation was made compulsory, has not passed unnoticed. During four months of 1898 there were over 2,000 cases of typhoid among 10,000 soldiers encamped in Florida; in 1911, among 20,000 men similarly encamped, there were but 2 cases. If such a degree of immunity can be harmlessly conferred upon a body of men living under adverse conditions and whose age renders them susceptible, the conclusion is that protection can just as easily be afforded ordinary citizens.

Anti-typhoid vaccination is quite as simple as that for smallpox and even children do not complain. There are no local effects other than a slight reddening at the site of the injection, and sore arms are entirely lacking. In a small percentage of cases a mild systemic reaction, accompanied by headache and a slight rise in temperature, occurs, but if the treatment is given at night the person's rest is undisturbed and he is entirely unaware of these symptoms. In the majority of instances, however, there is not the slightest inconvenience. The immunity probably lasts for several years, although its duration is less than that of smallpox, which frequently persists for a lifetime.

General Instructions for Hay Fever Sufferers.

The following instructions have been issued by the American Hay-Fever-Prevention Association for the benefit of its members and hay-fever sufferers in general.

As the autumnal form of hay fever, which is the most common, persistent and annoying form of this malady, is due in August, hay fever sufferers are urged to use the most active preventive measures at this time.

The pollens of the rag-weeds (*Ambrosia artemisiaefolia* and *Trifida*) are the irritating agents in practically every case of this form of hay fever, although the pollen of other weeds (golden rod, etc.), may aggravate the symptoms and in some cases even originate them.

In order to prevent or diminish the irritating cause of this autumnal hay fever, hay fever sufferers should remain away as much as possible from roads adjoining neglected fields, which is the habitat of these weeds. They should learn to recognize the rag-weed, so as to avoid neighborhoods where it is common.

Of special importance is the removal of the exciting cause from the neighborhood of the hay fever sufferer's home. In vacant lots and fields, especially if they have been at one time cultivated, the weeds should be cut down at once, which will prevent the pollenization of the rag-weed if present. In order to accomplish this, hay fever sufferers should explain to the owners the relationship of such pollens to hay fever, which is as well established as any other truth in medicine. While some underlying constitutional condition and some special sensitiveness of the breathing passages may be the predisposing cause, the direct exciting cause is one or more of these pollens. This can be easily demonstrated, as an attack may be produced in susceptible patients at any time of the year, by simply applying a few particles of the pollen to their nostrils.

When this is fully understood by the public, vacant lots and neglected fields with hay fever-producing weeds will soon become rare in the neighborhood of residences. Such a result may be attained by grazing cattle, by cultivation or mowing down the weeds before the time of pollenization. That this is entirely practical is demonstrated by the fact that it has actually been accomplished in some localities (Bethlehem, N. H., etc.)

In cases in which the owners, after such explanations, refuse to cut the weeds within incorporated limits, a report should be made to the local board of health, as most towns already have an anti-weed law. As the public becomes educated in the relationship of rag-weed and similar weeds to hay fever, of which several hundred thousands are victims in the United States, legislation

against hay fever-producing weeds in the neighborhood of residences and public roads will meet with little opposition.

In the majority of cases, a low nitrogenous diet (reduced in meats, fish, cheese, milk, etc.,) is of benefit in preventing or diminishing the attacks, unless contra-indicated by the low vitality of the patient. Remedies are for the most part unreliable, and should be used only under the directions of the physician. Many of these remedies contain some form of cocaine, and their continued use may establish the habit or injure the nervous system.

DR. W. SCHEFFEGRELL,

President American Hay Fever Prevention Association, New Orleans.

A Laboratory Method for the Diagnosis of Smallpox.

The invading organisms of several of the infectious diseases act as cutaneous allergens when injected into the skin of an animal previously sensitized. Jenner was the first to note this in his studies of smallpox. He found that the introduction of variolous material into the skin of persons previously sensitized by cowpox or smallpox virus caused certain dermatologic phenomena indicating immunity. In 1912 Tieche showed that these reactions were not produced by varicella material when introduced into the skin of a person previously vaccinated. He suggested the use of this reaction for differentiating smallpox and chickenpox, and used it himself with success in 34 cases, 14 of smallpox and 20 of chickenpox. Tieche used human beings and the authors decided to employ instead laboratory animals, which could not have been previously sensitized to chickenpox as might have been the case with human beings. The intradermal was used in place of the scarification method as the former has been shown by Von Pirquet and others to be more accurate. In the first experiment a series of five rabbits, previously vaccinated with rabbit-grown virus, was given intradermal injections of rabbit-grown vaccine virus. Controls were run with glycerine and normal rabbits. Positive reactions were obtained in all but the control rabbits. This experiment was repeated with guinea-pigs vaccinated with calf-grown virus, and the same results were obtained. Calves inoculated with calf-grown virus and afterwards tested with the same virus, reacted in the same manner. A second series of experiments was made, using vaccinated rabbits and testing with material from smallpox and chickenpox cases. In two smallpox cases positive results were obtained. Contents from the vesicles of a suspected chickenpox case were inoculated into several vaccinated rabbits and no reaction occurred. This case was an adult and the symptoms and signs were such as to render the diagnosis between chickenpox and smallpox very doubtful. To determine how long the sensitization lasted, vaccinated rabbits were tested fourteen weeks after vaccination and all reacted.

Other laboratory methods for the diagnosis of smallpox are:

1. Search for the cell inclusions first described by Guarnieri in 1892, and which requires experience and very careful technic.
2. The method of scarifying the cornea of a rabbit with a cover glass which has been dipped in the smallpox vesicle. This method requires very careful reading, and frequently the final interpretation is doubtful.

3. Inoculation of individuals previously sensitized by vaccination, described by Tieche. The disadvantages of this method have been mentioned.
4. The method described by the authors which overcomes the objections of the Tieche method.

For the last method the material may be easily collected and the reaction is easy to control by using normal rabbits. The material may be heated to 70° C. and extraneous organisms destroyed. For collecting the material small glass tubes similar to those employed for collecting blood for the Widal reaction, may be used. This method when sufficiently confirmed will be of great value to health officers in establishing the diagnosis of border-line and doubtful cases. — *Abs. the J. A. M. A.*, 1915.

Epidemiology of Typhus Fever.

There have been no epidemics of typhus fever on German soil for several decades, but the Russian prison camps are now the seat of true epidemics. When the disease first broke out in these camps it was thought to be influenza, and remained masked under this guise for some time. Soon it became evident that no influenza had existed, but that true typhus fever prevailed. The disease spread in these camps as long as healthy individuals remained, which is a feature peculiar to typhus fever. Lice were exterminated and afterwards the well mingled with the sick with impunity. Should lice again appear new cases of typhus fever may develop, for there may be carriers. Some of the German victims of the disease were not lousy when first seen, but this was probably on account of their cleanly habits, giving the louse no opportunity to settle upon their clothing or person. The author calls attention to the peculiar laws of contagion which are evident in all epidemics and which he calls the *genus epidemicus*. This alone will explain the reason why one epidemic is trivial and another malignant. — *Abst. Medical Record*, 1915.

Public Health Authorities and the Campaign Against Cancer.

The time has come for public health authorities to inaugurate an effective campaign for the prevention of cancer. While comparatively little is known about certain important phases of this problem, we have really a vast amount of old and new information which has not been used to its fullest extent. The first step in the control of cancer is to disseminate the present information, so that the public may know the truth concerning this subject.

The surgeon has made this a special field of study for years until surgery in cancer has approached nearly the limit of efficiency. The problem is no longer to improve surgery, but to see that the patient is brought to the surgeon, not when the case is hopeless, but when the time is favorable for a cure. For years a number of medical organizations have studied the problem of cancer. In 1913 the American Society for the Control of Cancer was organized and endorsed by these medical organizations and by a large number of influential laymen and women. The purpose of the society is stated in the constitution:

"To disseminate knowledge concerning the symptoms, diagnosis, treatment and prevention of cancer, to investigate the conditions under which cancer is found and to compile statistics in regard thereto." This society is a voluntary organization, its place is midway between investigators, research workers, statisticians on the one side, and the press and public on the other. The subject is much too broad for any one organization to handle and the time has come for health departments and officials to assist in bearing the burden. Certain municipal and state health departments have already begun a campaign of prevention along this line.

The most important factor in the reduction of the death rate in modern times has been the control of acute infectious diseases in early life. With this has gone a decrease of life expectancy at all ages above thirty-five. In other words, nothing has been done to reduce the death rate from the chronic diseases. Of these diseases cancer is probably the most important. Statistics would seem to prove that cancer is on the increase. At least it is an important cause of death. In 1912, 46,531 deaths were recorded in the registration area. This means probably 75,000 deaths in the whole United States. This should be contrasted with perhaps 150,000 deaths from tuberculosis and 15,000 from typhoid fever. The average age of death in cancer of all forms is 59 years. The mortality is nearly twice as great among women as among men. At ages over forty there are more deaths from cancer than from tuberculosis or pneumonia. These facts call for a persistent campaign of education based on all collected information. The following facts should be emphasized in such a campaign.

1. Cancer is at first a local and not a constitutional or blood disease.
2. In the early stages it is curable if properly treated.
3. Prompt and thorough surgical removal is the only effective treatment.
4. Cancer has not been proven to be hereditary or infectious.
5. In the early stages cancer is usually painless and often appears as a seemingly innocent lump or sore.

These and other facts concerning cancer must be repeated through the length and breadth of the land. There must, however, be no attempt to arouse carcinophobia. Lastly, to secure a more accurate record of the sickness and deaths caused by cancer, the statistical bureaus must co-operate with public health organizations and all other agencies for the control of cancer.—*Abst. American Journal Public Health*, 1915.

The Present Epidemic of Cerebrospinal Meningitis.

It has long been known that several strains of the meningococcus exist and the present observers have isolated two strains from fluids obtained by lumbar puncture in the present epidemic. These strains may be differentiated by means of their growth on serum-agar and glycerine agar. The strain classified as A shows a growth on these media which is in agreement with the classical descriptions of the meningococcus, while B gives a much more vigorous growth. Hunter and Nuttall obtained somewhat similar results in 1901. Both strains are gram negative, and little if any growth takes place on gelatin at 22 deg. C.

It has been suggested that a diagnosis of cases and suspected carriers may be made by examining blood films from the peripheral circulation for the meningococcus, but this method is open to grave objections. In the diagnosis of cases this method is unnecessary and in the detection of carriers organisms resembling the meningococcus, but which are not true meningococci may be found. The importance of contact carriers in disseminating the disease is known but Osler has pointed out the desirability of accurate information on the subject of carriers which are not contacts. Information on the method of entry of the meningococcus into the meninges is also necessary. Many points in the disease are strongly in favor of a primary blood infection. It has been suggested that such insects as fleas and lice may play a part in transmitting the disease and more precise knowledge is needed on this point. Certain observers have suggested that the meningococcus is merely a phase in the life cycle of an organism, which in some parts of its supposed cycle appears to be filterable. Outbreaks of the disease occur at a time when catarrhal inflammation of the respiratory passages is prevalent, and the question as to whether the *M. catarrhalis* or the meningococcus is the exciting cause of this inflammation is one that should be determined by routine bacteriological investigations. The government should authorize research upon these several points.—*Abst. from the Jour. of State Medicine*, 1915.

Syphilis in the Navy.

Although Metchnikoff's method for preventing syphilis by the use of calomel ointment immediately after exposure to infection has been in use in the navy for six or seven years, the reduction in the number of cases has not been so great as was anticipated. Syphilis in the navy is still one of the most important causes of morbidity as determined by the total number of days of sickness. A member of the medical service in the navy suggests that supplies of salvarsan and neosalvarsan be issued to every ship and station. The writer states that their administration on board ship or at stations and yards is just as practicable as at a hospital. The apparatus needed is simple and the administration of these drugs is safe if an aseptic technique is combined with reasonable care. The essentials for the prevention of syphilis in the navy are early exact diagnosis and intensive salvarsan—mercury treatment. A large proportion of the cases do not report until it is too late to establish a diagnosis by means of the primary sore, so early treatment is impossible. Persistent and complete inspection is necessary to detect the cases early. The author states that syphilis in the navy should be reduced to a minimum and that search for the treponema, inspection, and the use of salvarsan will reduce the losses of time attributable to infection with this organism.—*Abst. Medical Record*, 1915.

REPORTED CASES OF NOTIFIABLE COMMUNICABLE DISEASES, SEPTEMBER, 1915.

	<i>Cities.</i>	<i>Townships and Villages.</i>	<i>Total.</i>
Tuberculosis (all forms).....	387	88	475
Pneumonia	68	24	93
Typhoid Fever	371	284	655
Diphtheria	473	309	782
Whooping Cough	246	236	482
Measles	110	47	157
Scarlet Fever	208	192	400
Chickenpox	61	35	96
Smallpox	16	22	38
Mumps	20	40	60
Gonorrhea	187	102	289
Syphilis	75	14	89
German Measles	4	.....	4
Epidemic Cerebro-Spinal Meningitis.....	8	4	12
Acute Anterior Poliomyelitis.....	106	47	153
Ophthalmia Neonatorum	52	9	61
Trachoma	19	5	24
Dysentery	8	.....	8
Tetanus	2	2	4
Rabies	2	.....	2
Pellagra	1	.....	1
Total.....	2,424	1,460	3,884

REPORT OF THE DIVISION OF LABORATORIES, STATE DEPARTMENT OF HEALTH, FOR THE MONTH ENDING SEPTEMBER 30, 1915.

Diphtheria: Positive 69, negative 198, suspicious 38.....	305
Tuberculosis: Positive 81, negative 179.....	260
Typhoid: Positive 43, negative 75, suspicious 19.....	137
Rabies: Positive 15, negative 6, unsatisfactory 3.....	24
Malaria: Negative 4, suspicious 2.....	6
Water, chemical examination	42
Water, bacteriological	224
Milk	3
Food, Fertilizers, Miscellaneous.....	49
Total number of examinations as above.....	1,050

COMMUNICABLE DISEASES, SEPTEMBER, 1915.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
ADAMS COUNTY—										
Manchester	Vil.		2							
Jefferson	Tp.	1		2						
Meigs	Tp.			8						
ALLEN COUNTY—										
Delphos							1			
Lima		2	1	4	3					1
Harrod	Vil.	1								
Amanda	Tp.		1							
Auglaize	Tp.			4						
Perry	Tp.						1			
Shawnee	Tp.						1			
Sugar Creek	Tp.		2					1		
ASHLAND COUNTY—										
Ashland			1							
Clear Creek	Tp.									2
Perry	Tp.		1							
ASHTABULA COUNTY—										
Ashtabula		4	12							
Conneaut				1			1			
Jefferson	Vil.		1							
Ashtabula	Tp.			1						
Geneva	Tp.		1		1					
Jefferson	Tp.		1							
Monroe	Tp.			1						
Rome	Tp.	1								
Orwell	Tp.	1	1							
Richmond	Tp.	3								
Trumbull	Tp.				2					
ATHENS COUNTY—										
Athens										1
Nelsonville			2		3		4			
Buchtel	Vil.		2							
Athens	Tp.						2			
Dover	Tp.			1			1			
Lodi	Tp.	1	1							
Trimble	Tp.			2						
York	Tp.		4	5						
AUGLAIZE COUNTY—										
St. Marys			1				1			
Wapakoneta			1				1			
Duchouquet	Tp.		3							
Goshen	Tp.		1							
Jackson	Tp.	1								
Moulton	Tp.						1			
St. Marys	Tp.						1			
BELMONT COUNTY—										
Bellaire			1	2	2		2	1		
Martins Ferry			2	3						
Barnesville	Vil.						3			
Belmont	Vil.		1							
Bethesda	Vil.				2					
Bridgeport	Vil.						4			
Shadyside	Vil.		1							
Colerain	Tp.		1	2			1			
Pultney	Tp.		1				1			
Richland	Tp.		1	2			2			
Smith	Tp.	1	2							
Somerset	Tp.		1							
Warren	Tp.		1							
Wayne	Tp.	1								
Wheeling	Tp.		1							

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
BROWN COUNTY—										
Russellville	Vil.		1					1		
Sardinia	Vil.		2							
Lewis	Tp.									
BUTLER COUNTY—										
Hamilton		9	1			1	3			
Middletown		2	1	13	2		1			
Oxford	Vil.	1								
Fairfield	Vil.	1					3			
Madison	Vil.			1						
CARROLL COUNTY—										
Augusta	Tp.		1	2						
Brown	Tp.		1							
Rose	Tp.		1							
CLARK COUNTY—										
Springfield		7	8	9		3	3	1		
Bethel	Tp.		1	1						
Mad River	Tp.			2						
Springfield	Tp.	1	1	1			1			
CLERMONT COUNTY—										
Batavia	Vil.		1	2						
Milford	Vil.			1						
Moscow	Vil.									
Owensville	Vil.	1			4					
Williamsburg	Vil.	1	1			7				
Franklin	Tp.			4						
Monroe	Tp.				6					
Ohio	Tp.						1			
CLINTON COUNTY—										
New Vienna	Vil.		4					1		
Wilmington	Vil.		2	1						
Clark	Tp.		1							
Green	Tp.		2					1		
COLUMBIANA COUNTY—										
East Liverpool			2	4	1		1		1	
Salem				1						
Wellsville			1	1			2			
East Palestine	Vil.					7	3			
Leetonia	Vil.			4						
Hanover	Tp.		1							
Knox	Tp.			1						
Middleton	Tp.									1
Washington	Tp.		1							
COSHOCTON COUNTY—										
Coshocton			1					1	1	
Roscoe	Vil.				3					
Clark	Tp.	1								
Mill Creek	Tp.		1							
New Castle	Tp.		1							
CRAWFORD COUNTY—										
Bucyrus			1				1			
Galion			6							
Crestline	Vil.		1							
Holmes	Tp.		1							
CUYAHOGA COUNTY—										
Cleveland		128	43	51	146	70	50	38	18	3
East Cleveland				3			3	1		
Lakewood		2	2	1	1					
Bratenahl	Vil.		1				1			
Chagrin Falls	Vil.							3		
East View	Vil.			1						
Bay	Vil.					1				
Rocky River	Vil.			1						
Shaker Heights	Vil.					1				

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
CUYAHOGA COUNTY—Concluded.										
South Newburgh	Vil.			1						
West Dover	Vil.			8						
West Park	Vil.			1			2			
Euclid	Tp.		1		1					
Mayfield	Tp.			3			1			
Olmsted	Tp.			1						
Royalton	Tp.			2			1	1		
Strongsville	Tp.						5			
DARKE COUNTY—										
Greenville		1	3				1			
Burkettsville	Vil.			8						
Pittsburg	Vil.		2							
Union City	Vil.		1				2			
Versailles	Vil.		1				3			
Yorkshire	Vil.				1					
Adams	Tp.						1			
German	Tp.		1							
Greenville	Tp.		1							
Jackson	Tp.		1							
Patterson	Tp.						4			
Richland	Tp.		1				2			
Twin	Tp.		2							
Wayne	Tp.						2			
DEFIANCE COUNTY—										
Defiance		1	7	1					1	
Hicksville	Vil.		2							
Hicksville	Tp.		1							
Highland	Tp.	1			2					
DELAWARE COUNTY—										
Delaware							4			
Ashley	Vil.	1	2							
Concord	Tp.				8					
Liberty	Tp.						1			
Marlborough	Tp.		3							
Trenton	Tp.		1							
ERIE COUNTY—										
Sandusky		1	1	1						1
Kelleys Island	Vil.	2					1	2		
Milan	Vil.	1								
Vermilion	Vil.				3					
Milan	Tp.	1						1		
FAIRFIELD COUNTY—										
Lancaster				3			1			
Berne	Tp.						2			
Bloom	Tp.						1			
Greenfield	Tp.						1			
Madison	Tp.	1								
Rush Creek	Tp.		1							
FAYETTE COUNTY—										
Washington C. H.							2			
Green	Tp.		3							
Madison	Tp.		2							
Wayne	Tp.		1							
FRANKLIN COUNTY—										
Columbus		25	40	86	5	1	23	10		
Gahanna	Vil.		1							
Grove City	Vil.	1								
Hilliards	Vil.		1							
Westerville	Vil.				3					1
Worthington	Vil.		1							
Franklin	Tp.			1						
Jackson	Tp.			1						
Marion	Tp.		1	4			3			
Sharon	Tp.					1				
Truro	Tp.		2					1		

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
FULTON COUNTY—										
Swanton	Vil.			2			4			
Wauseon	Vil.		2							
Fulton	Tp.							1		
GALLIA COUNTY—										
Ohio	Tp.			2						
Walnut	Tp.			1						
GAUGA COUNTY—										
Burton	Vil.		1							
Chardon	Vil.			1	8				7	
Middlefield	Vil.				1					
Chardon	Tp.				5				1	
Troy	Tp.									
GREENE COUNTY—										
Xenia			1				2			
Clifton	Vil.			1	1					
Beaver Creek	Tp.		1							
Miami	Tp.			1	1					
New Jasper	Tp.	1			5					
GUERNSEY COUNTY—										
Cambridge		4		3	1		1			1
Byesville	Vil.			1						
Lore City	Vil.			1						
Pleasant City	Vil.			8						
Senecaville	Vil.						3			
Cambridge	Tp.						2			
Center	Tp.			1						
Jackson	Tp.			1			2			
Knox	Tp.						2			
Monroe	Tp.			1	2					
Richland	Tp.						3			
Valley	Tp.			2						
HAMILTON COUNTY—										
Cincinnati		115	9	21	73	13	11	7	1	1
Norwood		1		1	5	1				1
St. Bernard					2					
Cheviot	Vil.	1								
Harrison	Vil.				1					
Lockland	Vil.	2			1					
Mt. Healthy	Vil.			1			1			
Reading	Vil.				3		1			
Anderson	Tp.			1						
Columbia	Tp.				1					
HANCOCK COUNTY—										
Findlay		3		5	1	1			1	
Van Buren	Vil.					1				
Delaware	Tp.					1		1		
Eagle	Tp.				1					
Liberty	Tp.	1					1			
Marion	Tp.	1								
Pleasant	Tp.				1					
HARDIN COUNTY—										
Kenton					9					
Forest	Vil.						1			
Mt. Victory	Vil.						3			
Dudley	Tp.	1								
Jackson	Tp.			1						
HARRISON COUNTY—										
Cadiz	Vil.			1						
Freeport	Vil.			2						
Harrisville	Vil.	1					4			
Jewett	Vil.		1							
Cadiz	Tp.				5					
Green	Tp.				1					
Moorefield	Tp.			3						
Stock	Tp.			1						

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
HENRY COUNTY										
Holgate	Vil.			4						
Damascus	Tp.	1								
Marion	Tp.		1							
Pleasant	Tp.				2					
HIGHLAND COUNTY—										
Greenfield	Vil.	1	8							
Leesburg	Vil.	1			1					3
Marshall	Tp.		1		2					
Paint	Tp.		1							
Salem	Tp.						1			
Union	Tp.		2							
HOCKING COUNTY—										
Logan	Vil.			1						
Murray	Vil.			2						
Benton	Tp.		4							
Ward	Tp.		1	1						
HURON COUNTY—										
Bellevue						4				
Norwalk			2	2						
Greenwich	Tp.								1	
JACKSON COUNTY—										
Wellston			2	4						
Oak Hill	Vil.	1								
Bloomfield	Tp.		1							
Franklin	Tp.	1	1							
Jefferson	Tp.			1						
Milton	Tp.			1						
JEFFERSON COUNTY—										
Steubenville			6	4			4			
Adena	Vil.		2	2			1			
Empire	Vil.			1						
Mingo Junction	Vil.		2	2			1	1		
Saline	Tp.			3			1			
Warren	Tp.		1		5					
Wayne	Tp.			4						
Wells	Tp.				11					
KNOX COUNTY—										
Mt. Vernon			1				10			
Brinkhaven	Vil.		1							
Centerburg	Vil.						1			
Martinsburg	Vil.		2							
Clinton	Tp.						2			
Jackson	Tp.	4	4							
Morris	Tp.				1					
Pleasant	Tp.						1			
LAKE COUNTY—										
Painesville				2						
Fairport	Vil.			1						
Madison	Vil.			1						
Madison	Tp.		1							
LAWRENCE COUNTY—										
Chesapeake	Vil.	1		1			4			
Coal Grove	Vil.			1						
Hanging Rock	Vil.		1							
Proctorville	Vil.			1						
Aid	Tp.			1						
Fayette	Tp.			2						
Hamilton	Tp.		1							
Mason	Tp.	1	1	1						
Perry	Tp.					2				
Symmes	Tp.		1	6			2			
Union	Tp.			5			1			
Upper	Tp.			1						
Windsor	Tp.		1							

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
LICKING COUNTY—										
Newark	6		8	4						
Alexandria	<i>Vil.</i>		1							
Croton	<i>Vil.</i>		1							
Pataskala	<i>Vil.</i>		1							
Utica	<i>Vil.</i>						1			
Eden	<i>Tp.</i>		4							
Hanover	<i>Tp.</i>		1		1	1				
Harrison	<i>Tp.</i>		1							
Lima	<i>Tp.</i>		1							
Mary Ann	<i>Tp.</i>							1		
LOGAN COUNTY—										
Bellefontaine			4		4			3		
DeGraff	<i>Vil.</i>		1							
Rushsylvania	<i>Vil.</i>		1							
Miami	<i>Tp.</i>		2							
Monroe	<i>Tp.</i>		1							
Rush Creek	<i>Tp.</i>			1						
Washington	<i>Tp.</i>				2					
LORAIN COUNTY—										
Elyria			1		7		2			
Lorain	1	1	8	6		3	6	2		1
Oberlin	<i>Vil.</i>						6	2	2	1
Amherst	<i>Tp.</i>			1						
Black River	<i>Tp.</i>				1					
Elyria	<i>Tp.</i>						1			
Penfield	<i>Tp.</i>		1							
Ridgeville	<i>Tp.</i>		1	2					1	
Russia	<i>Tp.</i>	1							5	
LUCAS COUNTY—										
Toledo	43	2	65	17	47	9	12		2	1
Sylvania	<i>Vil.</i>		1							
Waterville	<i>Vil.</i>		1				3			
Adams	<i>Tp.</i>			6		10				
Oregon	<i>Tp.</i>		1							
Swanton	<i>Tp.</i>						6			
Waterville	<i>Tp.</i>						5			
Washington	<i>Tp.</i>			8	3					
MADISON COUNTY—										
London	<i>Vil.</i>			1			4			
Plain City	<i>Vil.</i>	1								
West Jefferson	<i>Vil.</i>			2						
Deer Creek	<i>Tp.</i>			1						
Monroe	<i>Tp.</i>		1							
Pike	<i>Tp.</i>				4					
Somerford	<i>Tp.</i>		2							
Union	<i>Tp.</i>		1							
MAHONING COUNTY—										
Youngstown	5	8	8	10	31	10	11	6	5	
East Youngstown	<i>Vil.</i>	8		2						
Lowellville	<i>Vil.</i>						1			
Poland	<i>Vil.</i>						1			
Struthers	<i>Vil.</i>						1			
Austintown	<i>Tp.</i>				2					
Berlin	<i>Tp.</i>				3					
Boardman	<i>Tp.</i>		1	1						
Coitsville	<i>Tp.</i>		1							
Green	<i>Tp.</i>	1			9					
Springfield	<i>Tp.</i>			1		8				
MARION COUNTY—										
Marion				1				1		
Claridon	<i>Tp.</i>									3
Pleasant	<i>Tp.</i>						3			
Tully	<i>Tp.</i>						1			

COMMUNICABLE DISEASES, SEPTEMBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MEDINA COUNTY—										
Medina	Vil.		1	1						
Brunswick	Tp.							1		
Chatham	Tp.		1							
Guilford	Tp.			1						
Hinckley	Tp.		1							
MEIGS COUNTY—										
Middleport	Vil.			1		2				
Racine	Vil.	1	1							
Chester	Tp.			6	2					
Scipio	Tp.		2							
Sutton	Tp.		1		1					
MERCER COUNTY—										
Celina	Vil.		3	1						
Butler	Tp.		4							
Marion	Tp.		5							
Recovery	Tp.						1			
MIAMI COUNTY—										
Piqua		3	1	1	2		2			
Troy					1					
Bradford	Vil.						5			
West Milton	Vil.						1			
Bethel	Tp.				4					
Brown	Tp.				4					
Union	Tp.						1			
Washington	Tp.				2					
MONROE COUNTY—										
Stafford	Vil.		1							
Woodsfield	Vil.		3							
Franklin	Tp.		2							
Jackson	Tp.				4					
MONTGOMERY COUNTY—										
Dayton		10	2	12	16	24	20	9	1	
Miamisburg	Vil.				1		1			
German	Tp.			1						
Harrison	Tp.				1		5			
Jackson	Tp.						2			
Mad River	Tp.				1					
Perry	Tp.	1								
Randolph	Tp.				1		1			
Van Buren	Tp.				1					
Washington	Tp.			2						
MORGAN COUNTY—										
Chesterhill	Vil.					1		1		
York	Tp.				1					
MORROW COUNTY—										
Mt. Gilead	Vil.								1	
Bennington	Tp.							4		
Gilead	Tp.				1				1	
South Bloomfield	Tp.	1								
MUSKINGUM COUNTY—										
Zanesville		1		2			3			
Falls	Tp.				1					
Hopewell	Tp.			2						
Wayne	Tp.			1		10				
NOBLE COUNTY—										
Caldwell	Vil.						1			
Noble	Tp.						1			
Seneca	Tp.					7				
OTTAWA COUNTY—										
Oak Harbor	Vil.	2								
Port Clinton	Vil.	8								
Catawba Island	Tp.	1								
Harris	Tp.			1						
Portage	Tp.	1								

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
PAULDING COUNTY—										
Latty	Vil.			1						
PERRY COUNTY—										
Corning	Vil.	2								
New Lexington	Vil.		1							
New Straitsville	Vil.			6						
Shawnee	Vil.				2					
Somerset	Vil.		2							
Bearfield	Tp.			1						
Hopewell	Tp.		2							
Monday Creek	Tp.			2	3					
Pike	Tp.			1						
Pleasant	Tp.		1		19					
Salt Lick	Tp.	1								
PICKAWAY COUNTY—										
Circleville			1							
Darbyville	Vil.				2					
New Holland	Vil.	1								
PIKE COUNTY										
Jackson	Tp.		1							
Newton	Tp.			1						
Sunfish	Tp.							1		
PORTAGE COUNTY—										
Ravenna			5	1						
Palmyra	Tp.					1				
Randolph	Tp.		1							
Suffield	Tp.		1							
PREFRLE COUNTY—										
Lewisburg	Vil.			1						
Somers	Tp.	1								
PUTNAM COUNTY—										
Columbus Grove	Vil.	1								
Kalida	Vil.					1				
Leipsic	Vil.		3							
Miller City	Vil.			1						
Ottawa	Vil.				2					
Blanchard	Tp.					3				
Jackson	Tp.					2				
Ottawa	Tp.			1						
Palmer	Tp.			7						
Perry	Tp.	1								
Van Buren	Tp.			3						
RICHLAND COUNTY—										
Mansfield			2			1				
Plymouth	Vil.							1		
Shelby	Vil.						1			
Shiloh	Vil.	1								
Jackson	Tp.						1			
Weller	Tp.				6					
ROSS COUNTY—										
Chillicothe		1	6				1			
Green	Tp.			1						
Huntington	Tp.		1							
Paint	Tp.		1							
Twin	Tp.									10
SANDUSKY COUNTY—										
Fremont		2	1	2	2	4	1			1
Woodville	Vil.		1							
Mulhisen	Tp.		1							
Riley	Tp.		1							
Sandusky	Tp.		1							
SANDUSKY COUNTY—										
New Boston	Vil.		1	15			2	2		
South Webster	Vil.	1								

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
SCIOTO COUNTY—Concluded										
Brush Creek	Tp.			2						
Green	Tp.		1				1			
Harrison	Tp.		1	3						
Madison	Tp.		2							
Morgan	Tp.	1								
Porter	Tp.		5	1						
Washington	Tp.			3						
SENECA COUNTY—										
Fostoria	1		1				1			
Tiffin	1		1	1	1	2		1		
Green Spring			1							
Adams	Tp.	1								
Clinton	Tp.		2							
Liberty	Tp.		1							
STARK COUNTY—										
Alliance			1				2			
Canton	2	1	8	3			10			
Massillon				11						
Brewster	Vil.		4							
Louisville	Vil.			1						
New Berlin	Vil.	1	1							
Marlboro	Tp.	1					1			
Nimishillen	Tp.			1						
Plain	Tp.						1			
Sandy	Tp.		1							
Sugar Creek	Tp.						1			
Tuscarawas	Tp.		1	1						
SUMMIT COUNTY—										
Akron	3		31	10	4		11	1		
Barberton	1		1	4			3			
Cuyahoga Falls	Vil.	2	1					1		
Kenmore	Vil.			2						
Macedonia	Vil.						1			
Mogadore	Vil.	3								
Bath	Tp.		1							
Portage	Tp.		1				1			
Stowe	Tp.						1			
Tallmadge	Tp.	1	1							
TRUMBULL COUNTY—										
Niles			2	7			1			
Warren	1		3			4				
Girard	Vil.		6							
Newton Falls	Vil.		1							
Champion	Tp.					4				
Farmington	Tp.		1							
Greene	Tp.		1							
Hubbard	Tp.	1	1	1						
Johnston	Tp.						1			
Kinsman	Tp.							5		
Newton	Tp.		2				1			
Weathersfield	Tp.		1							
TUSCARAWAS COUNTY—										
Canal Dover			1	2						
New Philadelphia			2	1		1				
Dennison	Vil.	1		4						
Newcomerstown	Vil.						3			
Shanesville	Vil.			1						
Strasburg	Vil.			40						
Sugar Creek	Vil.			1						
Tuscarawas	Vil.			1						
Uhrichsville	Vil.			3			4			
Auburn	Tp.	1								
Franklin	Tp.			11						
Lawrence	Tp.			3						

COMMUNICABLE DISEASES, SEPTEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
TUSCARAWAS COUNTY—Concluded—										
Mill	Tp.			1			1			
Oxford	Tp.						2			
Salem	Tp.	1	1							1
Union	Tp.			1						
Warwick	Tp.			1						
York	Tp.						1			
UNION COUNTY—										
Marysville	Vil.					1				
Jackson	Tp.				18					
Leesburg	Tp.	1								
Union	Tp.				2					
VAN WERT COUNTY—										
Van Wert				2			2			
Convoy	Vil.		1							
Harrison	Tp.						2			
Jackson	Tp.						3			
Tully	Tp.		1							
Union	Tp.	1								
VINTON COUNTY—										
McArthur	Vil.			1						
Vinton	Tp.		1							
WARREN COUNTY—										
Lebanon	Vil.						1			
Mameville	Vil.		1							
Hamilton	Tp.		1							
Turtle Creek	Tp.	1					1			
Union	Tp.									2
Washington	Tp.					3	1			
WASHINGTON COUNTY—										
Marietta		1	3							
Beverly	Vil.	1								
New Matamoras	Vil.		2							
Barlow	Tp.	1		1						
Dunham	Tp.		1							
Grandview	Tp.		1							
Salem	Tp.		1							
Warren	Tp.		5							
WAYNE COUNTY—										
Burbank	Vil.				25					
Creston	Vil.						1			
Dalton	Vil.	1								
Doylestown	Vil.		1							
Smithville	Vil.									1
Baughman	Tp.	1		1						
Congress	Tp.		1	2		1				
East Union	Tp.			1						
Greene	Tp.									1
Sugar Creek	Tp.		1							
Wayne	Tp.		4							
Wooster	Tp.			2						
WILLIAMS COUNTY—										
Bryan	Vil.		1							
Edon	Vil.		3							
Northwest	Tp.								3	
WOOD COUNTY—										
Bowling Green			2			1	1			
Grand Rapids	Vil.		1							
Hovtsville	Vil.				1			1		
Millbury	Vil.									1
Pemberville	Vil.			4						
Perrysburg	Vil.				2					
Portage	Vil.		1							1
Lake	Tp.		1							

COMMUNICABLE DISEASES, SEPTEMBER, 1915—Concluded.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of September, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
WOOD COUNTY—Concluded—										
Liberty	<i>Tp.</i>						1			
Middleton	<i>Tp.</i>			1			1			
Perrysburg	<i>Tp.</i>						1			
Plain	<i>Tp.</i>						1			
Ross	<i>Tp.</i>		1							
Troy	<i>Tp.</i>			1						
Washington	<i>Tp.</i>						1			
WYANDOT COUNTY—										
Carey	<i>Vil.</i>	1								
Upper Sandusky	<i>Vil.</i>			1	1					
Crane	<i>Tp.</i>	1			4					
Pitt	<i>Tp.</i>			1						
Sycamore	<i>Tp.</i>		2							
Tymochtee	<i>Tp.</i>						1			

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, SEPTEMBER, 1915.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
ALLEN COUNTY—								
Delphos		2						
Lima	4							
ASHTABULA COUNTY—								
Austinburg	<i>Tp.</i>	2						
Jefferson	<i>Tp.</i>				1			
Orwell	<i>Tp.</i>	1						
ATHENS COUNTY—								
Dover	<i>Tp.</i>					1		
Lodi	<i>Tp.</i>	1						
AUGLAIZE COUNTY—								
Wapakoneta		3						
Minster	<i>Vil.</i>						1	
BELMONT COUNTY—								
Bellaire		2						
BROWN COUNTY—								
Clark	<i>Tp.</i>	2						
Lewis	<i>Tp.</i>	1						
BUTLER COUNTY—								
Hamilton		5	1			1		
Middletown		2	1			1	2	
CLARK COUNTY—								
Springfield		1				1	1	b 1
CLERMONT COUNTY—								
Williamsburg	<i>Vil.</i>	2						
CLINTON COUNTY—								
New Vienna	<i>Vil.</i>	2						
COLUMBIANA COUNTY—								
East Liverpool		6	1					
Leetonia	<i>Vil.</i>				1			
Washington	<i>Tp.</i>	1		1				
CUYAHOGA COUNTY—								
Cleveland		4	2	6	43	28	5	c d 1
East Cleveland					3			
Euclid	<i>Vil.</i>				2			
DARKE COUNTY—								
Greenville		3						
Franklin	<i>Tp.</i>				1			
DELAWARE COUNTY—								
Ashley	<i>Vil.</i>	1				1		
ERIE COUNTY—								
Sandusky			1			1		
FAIRFIELD COUNTY—								
Carroll	<i>Vil.</i>	2						
FAYETTE COUNTY—								
Bloomingsburg	<i>Vil.</i>		1					
Green	<i>Tp.</i>	2				1		
Jefferson	<i>Tp.</i>							c 1
Paint	<i>Tp.</i>		1					
Union	<i>Tp.</i>	1						
FRANKLIN COUNTY—								
Columbus		5		1	1	1		c 1
Hamilton	<i>Tp.</i>	1						
GALLIA COUNTY—								
Cheshire	<i>Tp.</i>					1		
HAMILTON COUNTY—								
Cincinnati		27	33	1	3	5	2	
Norwood						1		
Addyston	<i>Vil.</i>	1						
Reading	<i>Vil.</i>				1			
Anderson	<i>Tp.</i>	2				1		
HANCOCK COUNTY—								
Findlay						1	1	

a Dysentery. b Pellagra. c Tetanus. d Rabies.

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, SEPTEMBER, 1915 — Continued.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
HARDIN COUNTY—								
Dudley .....Tp.					1			
HENRY COUNTY—								
Damascus .....Tp.	2							
HIGHLAND COUNTY—								
Greenfield .....Vil.	2							
Paint .....Tp.	3							
Union .....Tp.	3							
HOCKING COUNTY—								
Logan .....Vil.						2		
Falls .....Tp.							1	
HOLMES COUNTY—								
Glenmont .....Vil.					3			
Richland .....Tp.					1			
HURON COUNTY—								
Bellevue .....Tp.					1			
Norwalk .....Tp.					1			
JEFFERSON COUNTY—								
Steubenville .....Tp.	25	3						
Mingo Junction .....Vil.	2	1						
Warren .....Tp.	2	1						
KNOX COUNTY—								
Brinkhaven .....Vil.					1			
Jackson .....Tp.	1							
LAKE COUNTY—								
Willoughby .....Vil.					2			
LAWRENCE COUNTY—								
Perry .....Tp.						1		
LICKING COUNTY—								
Hanover .....Tp.	2							
Hartford .....Tp.	3							
LOGAN COUNTY—								
Washington .....Tp.	1							
LORAIN COUNTY—								
Lorain .....Tp.		1				1		
Henrietta .....Tp.					1			
LUCAS COUNTY—								
Toledo .....Tp.	36	27	1		3	7	1	
MADISON COUNTY—								
London .....Vil.	3	1						
MAHONING COUNTY—								
Youngstown .....Tp.	3	1				2		d 1
East Youngstown .....Vil.					1		1	
Struthers .....Vil.	6							
Boardman .....Tp.	1							
Poland .....Tp.	1							
MEDINA COUNTY—								
Brunswick .....Tp.				1				
MIAMI COUNTY—								
West Milton .....Vil.	1							
MONTGOMERY COUNTY—								
Dayton .....Tp.	3	1			2			
Germantown .....Vil.	1							
Jefferson .....Tp.		1						
Perry .....Tp.	1							
MORROW COUNTY—								
Sparta .....Vil.	1							
MUSKINGUM COUNTY—								
Zanesville .....Tp.					1			
Falls .....Tp.					1			
OTTAWA COUNTY—								
Port Clinton .....Vil.	2	2						
Danbury .....Tp.		1						

d Rabies.

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, SEPTEMBER, 1915 — Concluded.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
PORTAGE COUNTY—								
Garrettsville	<i>Vil.</i>				1			
Palmyra	<i>Tp.</i>			1				
Randolph	<i>Tp.</i>	1			1			
PUTNAM COUNTY—								
Columbus Grove	<i>Vil.</i>		1					
Blanchard	<i>Tp.</i>	1						
Union	<i>Tp.</i>	2						
RICHLAND COUNTY—								
Mansfield		5	1					
Bellville	<i>Vil.</i>				1			
Shelby	<i>Vil.</i>							c 1
Jefferson	<i>Tp.</i>				1			
Monroe	<i>Tp.</i>				1			
ROSS COUNTY—								
Chillicothe		1						a 1
Paint	<i>Tp.</i>	1						
Twin	<i>Tp.</i>	1						
SCIOTO COUNTY—								
New Boston	<i>Vil.</i>	5						
SENECA COUNTY—								
Tiffin		1			1	1	1	
Venice	<i>Tp.</i>	1						
STARK COUNTY—								
Canton					9		1	
Massillon					1		1	
Navarre	<i>Vil.</i>				2			
Osnaburg	<i>Tp.</i>	1						
SUMMIT COUNTY—								
Akron		1		1	29	1	4	
Barberton			1		6			
Cuyahoga Falls	<i>Vil.</i>	1						
Kenmore	<i>Vil.</i>				5			
Copley	<i>Tp.</i>				1			
Norton	<i>Tp.</i>				2			
Tallmadge	<i>Tp.</i>				9			
TRUMBULL COUNTY—								
Girard	<i>Vil.</i>	2						
Johnston	<i>Tp.</i>						1	
TUSCARAWAS COUNTY—								
Canal Dover					2			
New Philadelphia			1					
Uhrichsville	<i>Vil.</i>				3			
Lawrence	<i>Tp.</i>				3			
Salem	<i>Tp.</i>	1						
Warwick	<i>Tp.</i>					1		
UNION COUNTY—								
Richwood	<i>Vil.</i>	4						
Darby	<i>Tp.</i>	1						
WARREN COUNTY—								
Lebanon	<i>Vil.</i>	2						
Hamilton	<i>Tp.</i>		1					
Turtle Creek	<i>Tp.</i>	6						
WASHINGTON COUNTY—								
Barlow	<i>Tp.</i>			1				
Dunham	<i>Tp.</i>	4						1
Grandview	<i>Tp.</i>							
Warren	<i>Tp.</i>	2						
WAYNE COUNTY—								
Baughman	<i>Tp.</i>	1						
Salt Creek	<i>Tp.</i>	4						
WOOD COUNTY—								
Grand Rapids	<i>Vil.</i>	1						
Perrysburg	<i>Vil.</i>	2						

a Dysentery.

c Tetanus.

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Annual Reports.

- 1886, 87, 88, 89*, 90, 91, 92, 93, 94*, 95*, 96, 97, 98*, 99*, 1900, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12.
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THE MENACE OF INHERITED DEFECTS.

GEORGE B. L. ARNER, PH.D.,

Statistician, Ohio State Board of Health.

The right of every child to be well born, the right to enter upon the struggle of life without any handicap of inherited defect, should be one of the ideals of every public health worker. It is only too apparent that the attainment of this ideal will be extremely difficult if not impossible, but it is certainly possible to reduce greatly the numbers of those who are from birth either adnormal or subnormal. The population of the United States and the world is already great enough. Additional numbers are unnecessary. Quality and quantity is what the world should demand of the coming generation.

The studies of the biologists within the past half century have given us the basis for much effective work along these lines. The work to be done must be largely educational, as nothing can be accomplished until a certain amount of favorable public sentiment has been created. When the people come to a realization of the fearful amount of suffering and expense which results from the breeding of the unfit, the battle will be half won, for an aroused public sentiment will operate directly to prevent unfit matings, and will also force the passage of restrictive laws and will make the enforcement of these laws possible.

The inheritable defects are both of mind and body. Mental defects are of course the more serious, and individuals who are decidedly neurotic should never under any circumstances be allowed to reproduce. Feeble-mindedness in all degrees, insanity, epilepsy, chorea and other neuroses have been found to appear again and again in certain families, and there seems to be an interrelation among these diseases of the nervous system which may result in the appearance of any one among the offspring of neurotic parents. Conversely it is very rare that a marked neurosis, that is not the result of violence, appears in an individual who has no family history of neurosis. Such physical defects as blindness, deafness and deformed limbs should not be passed on to the coming generation, but such defects should not in every case operate as a barrier to marriage, as they may be bred out of the family strain.

Very few if any individuals are absolutely free from inheritable defect or the tendency to reproduce a defect. Some physical imperfections are not particularly serious, but every individual should familiarize himself with his own family history and with that of his intended mate. If inheritable defects are found which appear in both families, the probability of this defect reappearing in the offspring of the contemplated marriage would be great. If the defect appears in only one of the families, the probabilities are that it will not reappear in the offspring, because fortunately defects are usually recessive characters which will breed out unless the mating is with an individual having the same recessive character.

It is here that the danger lies in the marriage of blood relatives. Two members of the same family are likely to have the same biological characters

and a marriage between two members of the same family will accentuate any defects which may have been present in any of the common ancestors. For example a deaf man might marry a hearing woman and all their children and grandchildren would probably hear. But if two of these grandchildren should intermarry the deafness of the ancestor would be very likely to reappear in the children of this marriage. If two cousins come from a family which has manifested no mental or physical defect for four or five generations there may be no bad result of a marriage between them. In fact many marriages of first cousins have apparently accentuated good qualities, and produced exceptionally strong and brilliant offspring. But since so few people know their family history further back than their grandparents there are often defects present in the strain of which the present generation is entirely ignorant, and these defects may crop out as a result of a marriage within the family line.

Contrary to the general impression, there is no evidence that blood relationship in the parents in itself is directly harmful to the offspring. In many countries, particularly in Egypt and Peru marriages of brothers and sisters have been common and such marriages have produced healthy and normal children. In modern civilized countries, however, incest is a crime, and only persons of criminal tendencies or of low intelligence violate the moral law in this respect. Since normal and intelligent children cannot be expected from criminal and weak minded parents the fact that idiots and monsters have been born as a result of incestuous connections may have nothing to do with the fact of blood relationship. There is a strong popular prejudice in many quarters against the marriages of first cousins, and sixteen states, including Ohio, prohibit such marriages by law. Careful biological and statistical studies, however, have shown that there is no scientific basis for any prejudice against marriages between cousins of normal and healthy ancestry.

The important thing is then to popularize the results of studies into the laws of heredity and to impress upon the people the fact that practically all mental and many physical defects are transmitted from parents to children often in an aggravated form. Mental defectives in particular are apparently increasing more rapidly than the general population. Under the conditions of civilized life these defectives are very properly cared for and kept alive at the expense of the community.

When these unfortunates are confined in properly managed institutions there is little danger that reproduction will take place. The greatest danger lies in the victims of the lighter forms of neurosis who are either wholly or partially self-supporting, and who are given their full liberty. Our ideals of personal liberty are difficult to reconcile with the imposition of restrictions on such persons, but it must eventually be recognized that social self-defense demands that the privilege of reproduction shall be granted only to those whose children are likely to be of real value to society. The nation would be stronger with half the present birth rate if the better half of the children now born could be selected. It is only practicable, however, to restrict the sexual freedom of those who in person or in ancestry are manifestly unfit for the privilege of parenthood. This must be done or the beginnings of social degeneration which are already recognized will continue to develop until the whole structure of modern civilization will be menaced.

Civilizations have decayed and fallen in the past, and our civilization will also fall unless we can preserve it by the utilization of that scientific knowledge in which alone we are superior to the ancients.

THE TESTING OF INTELLIGENCE IN ITS RELATION TO THE PUBLIC HEALTH.

RUDOLPH PINTNER, PH. D.,

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The adequate carrying out of a program of public health depends largely upon the intelligence of the community. The public must understand the questions at issue and do its share in the work. The truth of this is obvious by the emphasis that is placed upon the education of the public in matters of public health, and by the existence in some states of a special department for this purpose. It is, however, the public health nurse, engaged in dealing with individual cases, who is faced with the actual concrete problems of stupidity, ignorance and obstinacy as they occur in specific instances. The understanding of such factors in the light of modern work on feeble-mindedness and defective mentality would in many cases throw a new light upon such situations and perhaps hasten their solution.

It is just here that intelligence tests might prove a valuable adjunct to the public health nurse. In the school or in the home she is bound to meet individuals who raise in her mind a suspicion of mental defect. A Binet test may strengthen these suspicions and, without the attempt at any diagnosis on the part of the nurse, may show the desirability of a more thorough examination. Such cases might well be referred to a physician or psychologist for further study. And even if nothing can be done owing to local conditions, the insight that a mental examination of a child or adult may give, will make clearer the conditions with which the nurse may have to cope. In this respect it is well to remember that it is not the absolutely feeble-minded, the idiot or the imbecile, that constitute the greatest problem, for these are largely under institutional care, but it is the higher grade defective, passing for normal, that causes the most trouble. The factor of mental deficiency is often lost sight of, whereas it is frequently at bottom of the thoughtlessness, shiftlessness and carelessness that bring disease and misery in their train. Deficient mentality is the cause of many failures to make good in life, of much alcoholism and of much poverty. A knowledge of mental testing, or, better still, a training in the application of mental tests cannot help but give the public health nurse a new point of view as to the relationship of mental deficiency and public health.

At the present time the Binet Scale in some form or other is being widely used all over the country in schools, institutions, clinics, juvenile courts and elsewhere. It is used by psychologists, physicians, teachers and social workers. It forms such an admirable aid in arriving at some decision as to the mentality of an individual within a relatively short period of time. Without it only the wildest guess in regard to an individual's mentality is in

general possible. With it we can reach a very fair judgment of a person's level of intelligence. A child can be adequately examined in less than an hour with the help of the Binet Scale and a more thorough knowledge of his ability attained than many a teacher is able to arrive at after weeks of instruction in the class. It yields, of course, the best results in the hands of the expert, and it may become ridiculous in the hands of the amateur. Although it is questioned by some¹ whether the Binet Tests can give reliable results in the hands of other than psychologists, it is in general conceded that this work can be done effectively by teachers and others who have had some special training in applying the tests, without any special knowledge of psychology.² A certain amount of practice is absolutely necessary to acquire the technique of giving the tests, and a certain training in order to appreciate the necessity of adhering strictly to the recognized mode of procedure in presentation. Amateurs are the greatest sinners in this latter respect, failing to see that the whole significance and degree of difficulty of a test may be changed by some slight change in the method of presentation. It can never be pretended that the Binet worker will be able to give as adequate a diagnosis as the trained psycho-clinician, but the result of a Binet test may very often help in understanding a child better and in some cases of confirming suspicions of feeble-mindedness.

The Underlying Theory of Intelligence Testing. The attempt to measure intelligence is one of the problems that is exercising the minds of many psychologists at the present time. It has reached the stage of practical usefulness by the construction of scales of mental measurement whereby we are able to differentiate fairly accurately various degrees of intellectual development.

Intelligence has been well defined by Stern³ as the ability of the individual to adjust himself to a relatively new situation. If one individual is unable to adjust himself to a certain number of situations to which another individual can make the necessary adjustments, then the former is most likely inferior in intelligence to the latter, provided always that the situations are relatively new to both individuals. The new situations that the psychologist provides are the mental tests. They very seldom demand knowledge that the individual has acquired during his school life or during his later career in the world. They try on the other hand to present something that shall be new to all individuals, so that each one shall face the test on equal ground so far as previous knowledge of the test is concerned. For this reason some of the tests seem very absurd to the unsophisticated onlooker who is not aware of what the psychologist is trying to elicit by the performance of the test.

¹ Wallin, J. W. *The Mental Health of the School Child*. Yale University Press, 1914.

Whipple, G. M. *The Amateur and the Binet-Simon Tests*. *Journal of Educational Psychology*. Vol. 3, 1912, p. 118; and *Amateurism in Binet Testing* once More. *Ibid.*, Vol. 4, 1913, p. 301.

² Cf. Kuhlmann, F. *Some Results of Examining with a Revision of the Binet-Simon Tests of Intelligence by Untrained Examiners*. *Journal of Psychophysics*, September, 1913. Vol. 18, No. 1. Doll, E. A. *Inexpert Binet Examiners and their Limitations*. *Journal of Educational Psychology*, Vol. 4, 1913, p. 607. Goddard, H. H. *The Binet Tests and the Inexperienced Teacher*. *Training School Bulletin*. Vol. 10, 1913, p. 9.

³ Stern, William. *The Psychological Methods of Testing Intelligence*. Translation by Whipple. Warwick and York, 1914.

It cannot be said, however, that every test in the common scales of intelligence now in use fulfill the requirements here laid down. There are some that call for knowledge gained in school life,⁴ i. e. things that are sometimes an actual part of the instruction of the common schools. These tests are as a rule not very satisfactory for purposes of measuring intelligence. For it must be remembered that we are not trying to measure school knowledge but rather inherent native ability. Educational scales⁵ and tests of school subjects have their recognized place in measuring the progress of the child in school work and in throwing light upon the efficiency of the teacher, but they do not give us a direct answer as to the native ability of a child. For this purpose we require the psychological test that presents a new situation to be solved.

Presuming now that we have found tests of this nature, the next question that arises is, how we evaluate the response or solution of the test that a child may make. For this purpose we must be able to compare the performance in question with that of many other children, so that we may say that it is better, equal or worse than these other performances. We must know, in short, what a normal child is able to do with our tests. This is the problem of standardization, which is too technical and too extensive a subject to go into in this paper. Let it suffice to say that we may group our responses according to the average performance of normal children at various ages, so that we speak of a certain performance as being equivalent to the performance of a six-year-old child, a seven-year-old child and so on. In this way we come to speak of a child possessing the mentality of a certain age, say, for example, the mentality of a nine-year-old child. We mean by this that, regardless of the actual age of the child, he behaves on the whole like a nine-year-old. If he is actually fifteen and behaves like a nine-year-old, there is obviously something radically wrong; if he is actually nine, then we are finding what is to be expected in the child; if he is actually six, then he shows a level of mental development far above the ordinary six-year-old. From this will be seen the necessity of knowing what normal children can do with any test before it can become useful for purposes of measuring a child's intelligence. Any test chosen at random will not help us, but only those tests that have been adequately standardized. Furthermore, any one test is unable to give us a picture of such a complex as is denoted by the term intelligence. Hence we need a number of tests in order adequately to judge the intelligence of an individual. This fact has led to the construction of mental measurements, or in other words, groups of tests that will adequately include all the factors in the growth of intelligence of the child.

The Binet-Simon Scale. The first scale to be constructed and the most widely known one is the scale that bears the names of Binet and Simon,⁶ the two famous French psychologists. It was a practical situation that they were

⁴For example tests VII, 3 and IX, 4 in Goddard's revision of the Binet-Simon Scale.

⁵Such as the Writing and Reading Scales of Thorndike, the Writing Scale of Ayres, the Spelling Scales of Buckingham and of Ayres, the Courtis Arithmetic Tests and others.

⁶Binet et Simon, see various articles in *L'année psychologique*, Vol. 11, 1905; Vol. 14, 1908; Vol. 15, 1909; Vol. 17, 1911. See also Binet and Simon, *A Scale for Measuring the Development of the Intelligence of Young Children*, Translation by C. H. Town. Lincoln, Ill. Courier, 1913.

called upon to solve, namely the selection of the most backward and feeble-minded in the schools of Paris, in order that these children might be removed from the ordinary classes for more adequate training and not continue as a burden and drag on the normal children. They constructed their scale of intelligence for this purpose, feeling strongly that they could diagnose more rapidly and with greater certainty the cases they were called upon to examine. And in the practical use of the scale by the authors, its general construction and the underlying ideas were vindicated.

In brief, the scale consists of a number of tests, generally five for each year of a child's life from age three to age twelve. In addition there are some tests above age twelve which have proved of doubtful value. In all there are about fifty tests arranged according to age. By applying the tests we are able to find the age level which the subject reaches and this tells us the mental standing of our subject. The tests have been selected so as to cover the chief factors that are supposed to be included under intelligence. There are tests for attention, imagination, reasoning, judgment, perception, suggestibility and different kinds of memory, as well as for knowledge of various facts which children at definite ages have been found to possess.

The ordinary procedure in using the scale is to begin with those tests which the child is likely to know and, having once found the point at which all the tests of a certain age group can be answered, to proceed up the scale as far as possible. The year at which the child passes all the tests of an age group is technically termed the basal age and to this basal age any additional tests passed by the child are added, each test being allowed to count one-fifth of a year. It is necessary, of course, during the examination to secure the entire confidence of the child and to elicit from him all that he really does know. The good examiner will soon secure this confidence and will see to it that the child enters into the examination in the spirit of play. If the examiner possesses tact and some experience in dealing with children, he or she will never fail to secure the full co-operation of the child. Indeed the vast majority of children think it is a splendid game, and they are eager to show how well they can play it. A mental examination should not be given in the presence of onlookers. This sometimes cannot be avoided, but the presence of a parent or teacher very often makes the child nervous or over-anxious to do well. The examiner must never correct the child's mistakes, but must continually encourage the child and praise liberally all answers whether good or bad. The examiner is not teaching the child but trying to find out what he knows, and this will be best attained if the child imagines that he is doing well all the time. As a rule it requires from thirty to fifty minutes to give a thorough Binet examination. It is dangerous to keep most children longer, since loss of interest and fatigue may result. In most cases thirty to forty minutes is ample. Should the child be suffering from any extraordinary condition, such as physical pain or illness or mental excitement, the examination must be postponed, or else the findings may give an entirely false picture of the mental condition.

The original Binet-Simon Scale has been revised and adapted for American conditions by many workers. Goddard's^{*} revision is one that is

^{*}Goddard, H. H. The Binet-Simon Measuring Scale for Intelligence. Revised. Training School Bulletin. Vol. 8, 1911, p. 56; Standard Method of Giving the Binet Test, Training School Bulletin, Vol. 10, 1913, p. 23.

widely used. In addition there are revisions by Kuhlmann,⁹ and by Wallin,¹⁰ and another revision by Terman¹¹ is to appear shortly. A selection of the original Binet tests along with a radical change in the method of computing mental age has recently appeared in the form of the Yerkes-Bridges Point Scale,¹² which is claimed to give much more accurate results as far as older children above the age of fourteen are concerned. Many other examiners supplement the tests of the scale by other tests, such as the performance tests of Healy,¹³ and the rough scale of performance tests used by Knox¹⁴ for testing non-English speaking immigrants at Ellis Island.

All this amount of work is leading gradually to more and more refined measures of intelligence, and there can be no doubt that as the work increases, the reliability of our measurements will also increase. We are merely at the beginning of a long series of scales that will aim to measure all the various factors in the psychological make-up of the individual.

PRACTICAL QUESTIONS IN HEALTH ADMINISTRATION.

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1. The Creation, Authority and Jurisdiction of Municipal and Township Boards of Health.

The General statutes provide for a board of health in each municipality and township. Sections 4404 and 3391 G. C. Two exceptions are to be noted. The State Constitution (Art. XVIII, Sec. 3) gives to municipalities authority to exercise all powers of local self-government—which means that any municipality in the state by observing the formalities required in the adoption of a municipal charter may substitute some form of health administration at variance with that provided in the general statutes.

In a village a health officer may be appointed to serve in place of a board of health when the council deems such action advisable. If this is done all the duties of the board of health are transferred to health officer. Council has no legal right, either as a whole or by committee, to assume the functions of a board of health.

In the establishment of a board of health or of the office of health officer it is necessary that an ordinance be passed by council.

⁹Kuhlmann, F. A Revision of the Binet-Simon System for Measuring the Intelligence of Children, Journal of Psycho-Asthenics, Monograph Supplements, No. 1, 1912.

¹⁰Wallin, J. E. Wallace, Experimental Studies of Mental Defectives, Educational Psychology Monographs, No. 7, Warwick and York, 1912.

¹¹Cf. Terman and Childs, A Tentative Revision and Extension of the Binet-Simon Measuring Scale of Intelligence, Journal of Educational Psychology, Vol. 3, 1912, four articles.

¹²Yerkes, R. M. and Bridges, J. W. A Point Scale for Measuring Mental Ability, Warwick and York, 1915.

¹³Healy and Fernald, Tests for Practical Mental Classification. Psychological Review Monograph Supplements, Vol. 13, No. 2, 1910; see also Healy, W. The Individual Delinquent. Little, Brown and Co., 1915.

¹⁴Knox, Howard A. The Journal of the American Medical Association, March 7, 1914. Vol. 62, p.741.

A municipal board of health is composed of five members; appointed by the mayor subject to the confirmation of council. No qualifications are prescribed by law and only occasionally do we hear of a member of a board of health selected because of his special qualifications for the work. Formerly the statutes provided that not more than three members could be physicians, but this provision was repealed several years ago. It is to be regretted that in the selection of members the qualifications of the appointee have not always been considered.

The mayor is president of the board, by virtue of his office but is not a member and is not entitled to a vote. It is necessary that a president pro tem. be selected by the board and it is the duty of this officer to perform the functions of president in the absence of the mayor.

In the municipal charters that have been adopted in Ohio various forms of health organization have been provided. The most common being that of a health commissioner under the supervision of the director of public welfare.

In townships the persons duly elected as trustees constitute the board of health. This is a mandatory proceeding and it is not within the authority of the trustees to decline the duty. The only requirement in regard to organization is that the trustees shall meet annually and organize as a board of health, elect a president, etc.

The jurisdiction of a municipal board of health, insofar as relates to the control of communicable diseases, abatement of nuisances, etc., is co-extensive with the boundaries of the corporation. In order to control the milk and meat supply of the city or village, a municipal board of health may send its representatives to any place outside the corporation where milk is produced or meat is prepared for sale.

The jurisdiction of a township board of health extends to all that part of the township that is outside the limits of an incorporated city or village.

The statutes do not specifically enumerate all the powers and duties of a board of health. Some authority is given in general terms and some in detail. It is generally supposed that a board of health has unlimited powers but this power must be connected with and be exercised only in the furtherance of duties that have been laid upon boards of health by law. In general terms these duties relate to the protection of the public from diseases that are communicable from one person to another and from conditions that are a menace to health or comfort.

The duty that rests upon a municipal council to establish a board of health, or to appoint a health officer to serve in place of a board of health, and the duty placed upon the trustees of a township to act as a board of health for the township are mandatory duties and not directory, that is, subject to the discretion of council or the trustees. This is evidenced by the fact that the State Board of Health has the authority to appoint a health officer who must perform all the duties and who has all the powers of a board of health. The compensation of a health officer so appointed and any expense incurred by him in the performance of his duties are a valid claim against the municipality or township.

2. The Appointment of a Health Officer. His Qualifications and Compensation.

The statutes do not prescribe what qualifications a person shall have who is appointed as health officer. The selection of the health officer and all other employes rests with the board of health and it is a matter of common observation that in most cases little care is given to the qualifications of appointees. This has been remedied to some extent in cities by civil service rules but there is room for improvement in both municipalities and townships.

As physicians, in small communities, are the only persons who have had any training in sanitary matters it is advisable to appoint a physician where possible. We have some efficient health officers who are not physicians but in such cases we find that the health officers has access to a physician who advises him in all matters of a medical nature. We also have some physicians who have proven themselves to be inefficient health officers. A health officer, whether a medical man or not, should not be selected because of political influence or because the municipality or township thinks it necessary to provide him an office, because of past services, age or infirmities. You may be surprised to know that bedridden persons have been appointed as health officers in Ohio and it is not uncommon to have men appointed who are too infirm from age or disease to be able to walk about. To be a success as health officer a man must not only be intelligent but he must have good common sense and be physically able to perform any service that may be required.

The compensation of the health officer is fixed by the board of health or by council where there is no board of health. In the statute giving this authority (Section 4411-1) it is provided that the board shall fix the salaries of its employes. This would indicate the intention of the legislature to be that health officers should be compensated by fixed salaries and not on a per diem or fee basis. It is apparent that, as a rule, health officers are not adequately paid. This has been true since health officers were first appointed. No change can be expected until the public is educated to the necessity of conserving the public health in every possible way and when this is done there will be a demand for properly qualified officials and it is to be expected that when such a demand is made the appointee will receive an adequate compensation for his services. There is no standard for salary or fees. Each health officer must make his own contract and take what he can get. It must be understood, however, that when a man accepts the office, no matter how small the salary, he is expected, and can be compelled to perform all the duties required of him by the statutes or the orders and regulations of the State Board of Health and those of his local board. A health officer has little reason to complain of lack of compensation as he should know what this is to be before he accepts the office. On the other hand the board of health should be compelled to pay all that it agrees to pay.

3. What Constitutes a Sanitary Code.

A sanitary code to be complete must cover the main activities of the board of health. These are (1) Administration, (2) the control of contagious and infectious diseases, (3) the prevention, abatement and suppression of nuisances, and (4) the control of foods and food products.

Under "administration" will come regulations in regard to the operations of the board, prescribing duties of employes, etc.

Under "contagious and infectious diseases" provision is made for reports, quarantine of cases and exposed persons, disinfection, conduct of physicians, nurses, and other matters relative to the control and prevention of disease.

Under "nuisances" provision is made for regulating the location, construction and cleaning of privies, cesspools and other reservoirs used as receptacles for human or animal excreta, for the disposal of excreta, garbage, house slops or other putrescible wastes. The manner of keeping animals, conducting slaughter houses, rendering plants, etc.

Under the heading "food" is included all regulations for the protection of foods and food products. Methods of handling milk and meat; permits to sell milk and meat; regulation of sanitary conditions at dairies and slaughter houses; the sale of unwholesome, decayed or immature meat, fruits, vegetables, etc.

In a city or village all general orders must be adopted, advertised, recorded and certified as are municipal ordinances.

In adopting a sanitary code there must be a reading at three separate meetings unless by a three-fourth vote the rule is suspended. There should be one reading of the code in full. Subsequent readings may be by title. The records must show the vote and that a majority of a quorum voted for adoption.

The code must be printed entire in two newspapers published in the village if there are two; if not, then publication in one. Publication must be had once a week for two consecutive weeks. The code takes effect ten days after first publication. If there is no newspaper published in the village the code may be published by posting in five of the most public places for a period of not less than fifteen days.

All general orders and regulations must be recorded in a book kept for that purpose. Care must be taken in recording so that the record and the published copy are exactly the same.

After the publication the publisher will furnish proof of publication properly attested. This must be made a part of the record. When adopted by health officer in lieu of board of health must be approved by State Board of Health before publication.

In a township the code must be adopted with the same formalities specified for a village, except that the code must be posted in five places within the township. Publication in a newspaper will not take the place of posting and it would be illegal to pay for publication.

The code will provide the methods for its enforcement. The health officer as the executive officer of the board is charged with the duty of enforcing the regulations. This will be provided for under the title "Administration."

We have here copies of the sanitary code recommended to village and township boards of health for adoption and shall be glad to have you take these with you for your consideration.

4. Who Pays the Expense of Quarantine and Disinfection?

This question is best answered by quoting the statutes.

Section 4136. When a house or other place is quarantined on account of contagious diseases, the board of health having jurisdiction shall provide

for all persons confined in such house or place, food, fuel, and other necessities of life, including medical attendance, medicines and nurses, when necessary. The expenses so incurred, except those for disinfection, quarantine, or other measures strictly for the protection of the public, when properly certified by the president and clerk of the board of health, or health officer where there is no board of health, shall be paid by the person or persons quarantined, when able to make such payment, and when not by the municipality in which quarantined."

Section 4433. * * * The local board of health may purchase such disinfecting apparatus and supplies as it deems necessary (for such purpose). The expenses of disinfection shall be paid by the local board of health."

The difficulty here presented is in determining what are included as quarantine expenses. The law contemplates under this term the means or methods necessary to forcibly detain those sick or exposed to a communicable disease. Expenses incurred for medical or nursing service, medicines, fuel, food and other necessities, are not quarantine expenses and the board of health is only required to pay these expenses when the family quarantined is unable to pay, the board of health being the judge as to the financial circumstances of the family or individual.

As to disinfection there can be no question as the board of health is required to pay all this expense including both material and labor. It is not legal for a board of health to furnish the material for disinfection and to require the family to do the work. The work must be done by the health officer or some person appointed for that purpose and in the manner prescribed by the State Board of Health.

A board of health is not required to disinfect unless there has been a contagious disease in the house or building.

5. The Procedure to be Followed in the Abatement of a Nuisance

The procedure to be followed by a board of health in the abatement of a nuisance is to be found in Sections 4420-4424 inclusive, of the General Code. The first thing to do when a complaint is received is to make an investigation to determine the existence of the nuisance. This fact being established, an order must be issued to the owner, tenant or agent of the owner requiring the abatement of the nuisance within a time to be specified in the order, the only requirement being that a reasonable time be allowed. What is a reasonable time will depend upon the character of the nuisance and the amount of time necessary to do the work. The order should state what is necessary to be done and, if there are local regulations concerned, the manner or method to be followed.

If, at the expiration of the time specified, the order has not been substantially obeyed the board of health has the option of prosecuting the offender or of proceeding with the abatement of the nuisance by furnishing the material and labor necessary to do what the offending person should have done. If prosecution is decided upon an affidavit should be filed and a warrant secured for the arrest of the offender. A warrant will be issued and the case be tried by the police court in a municipality having such a court or by the mayor or a justice of the peace where there is no police court.

Special provision has been made for the prosecution of private corporations which fail to obey the orders of a board of health. In such cases the

penalty provided is a fine of not to exceed \$300 to be collected in a civil action brought in the name of the municipality or township. An officer of a corporation may also be prosecuted as provided in other cases. (Sec. 4415 G. C.).

As imprisonment *cannot* be a part of the penalty under an affidavit for a first offense and as the prosecution must always be as and for a first offense unless the affidavit states that it is a second or repeated offense, a trial by jury cannot be demanded. (Sec. 4414 G. C.; 42 O. S. 186.) A fine assessed and collected in such a case must be paid into the municipal treasury and credited to the sanitary fund of the board of health instituting the prosecution. The magistrate before whom such a prosecution is brought does not have authority to remit a fine that has been imposed. (Sec. 4418 G. C.)

If the board of health elects to abate the nuisance by doing whatever the offending person should have done it must first give notice and a hearing to the person or persons responsible for the abatement of the nuisance. If after the person has been fully informed as to the cause of complaint a promise is made to abate the nuisance a reasonable time must be granted. If such promise is not made or kept the board can then furnish the necessary material and labor, have the work done and certify the cost to the county auditor to be assessed against the property and collected as are other taxes. (Sec. 4422-4423 G. C.) This peremptory procedure for the abatement of nuisances can be and is to some extent followed but is undesirable for the reason that it involves a considerable outlay of money. This money will ultimately be converted into the municipal treasury but it is hardly equitable to require the person who performed the work or furnished the material to wait until the tax is collected to get his money. Then again, if the board of health pays for the work and material there is no provision that the tax when collected will be credited to the sanitary fund and an action of council would be necessary to accomplish this. An ideal arrangement would be to have an adequate fund set apart for this purpose and have the fund made, continuing by a provision that the tax when collected be credited to the fund.

Another peremptory way of abating a nuisance, especially effective for rented property, is to order the property vacated until necessary repairs or improvements have been made. The owner will soon come to time if his revenue is cut off.

A class of nuisances that cause much annoyance to a board of health, especially in the rural districts, is the abatement of nuisances on school property. Boards of health are required to inspect semi-annually the sanitary condition of all schools and school buildings within their jurisdiction and must abate all nuisances and remove or correct all conditions detrimental to health or well being found upon school property.

These inspections may be made oftener if in the judgment of the board there is need for inspection. When insanitary conditions are found an order must be served upon the board of education or other person responsible for the property, stating the condition to be corrected and a reasonable time must be allowed for performing the work. A person failing to obey such an order, unless good and sufficient reason can be shown, is liable to prosecution and upon conviction to a penalty of not to exceed one hundred dollars. (Section 4448 and 4424 G. C.)

That there be no misunderstanding in regard to the abatement of nuisances in the rural districts it may be said that the township board of health has the same jurisdiction in the abatement of nuisances as has the board of health of a city or village and is under like obligation to act in such matters. (Sec. 3394 G. C.)

6. How the Expenses of Boards of Health are to be Met.

The expense that may be incurred by a board of health is governed by two things: (1) The expense that is necessary to carry out a specific requirement of law, and (2) such expense as is necessary to carry on the routine work of the board and to perform the many things the board is permitted by law to do.

Section 4451 reads as follows:

"When expenses are incurred by the board of health under the provisions of this chapter, upon application and certificate from such board, the council shall pass the necessary appropriation ordinances to pay the expenses so incurred and certified. The council may levy and set apart the necessary sum to pay such expenses and to carry into effect the provisions of this chapter. Such levy shall, however, be subject to the restrictions contained in this title."

To provide for extraordinary emergencies the legislature has enacted Section 4450.

"In case of epidemic or threatened epidemic or during the usual prevalence of a dangerous communicable disease, if funds are not otherwise available, the council of a municipality may borrow any sum of money that the local board of health deems necessary to defray the expenses necessary to prevent the spread of such disease. Such money may be borrowed until the next levy and collection of taxes is made, at a rate of interest not to exceed six per cent. per annum. Thereupon the board may expend the amount so authorized to be borrowed, which amount, or so much thereof as is expended, shall be a valid claim against the municipality from the fund so created."

The expenses of the township board of health are to be paid from the fund for township purposes unless a special levy is made for sanitary purposes. If the levy for township purposes is not sufficient, and the maximum allowed by the statute has not been reached, the levy may be increased within the limits allowed by law, so as to provide an amount to cover the expenses of the board of health, as well as other township expenses. (A. G. 1893).

Controversies have frequently arisen as to the use of the "poor fund" in paying the expenses of the board of health. This controversy will most frequently arise between the township and a municipality in that township when the trustees attempt to pay the expenses of the township board of health out of the "poor fund" and at the same time will deny this right to the village. The "poor fund" is not to be used by either the township or the municipality in the payment of such expenses unless the person for whom the expense was incurred is already a township charge. If this is the case the fund should be as accessible to the village as it is to the township. (A. G. 1893.)

A FATAL CASE OF SLOW POISONING IN THE PERSON OF A YOUNG MAN EMPLOYED AS A SPRAYER IN A VARNISHING DEPARTMENT.

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The dangers connected with the inhalation of fumes from naphtha (perhaps admixed with benzol) and turpentine in filling and varnishing various objects and wares has been cited before, but, strange to relate, little has been done in certain establishments to control effectively this danger. This is due partly to ignorance of the increased dangers which the method of spraying brings about, and partly to indifference on the part of the employer as well as the workers themselves. It is sometimes difficult to convince an employer that some particular department or process in his establishment is a menace to the health of the workers. He will usually point to one particular employe who has worked in the alleged danger for a number of years, who, perhaps, has steadily gained in weight and who is, apparently, in good health. Such an individual may be regarded as one who eliminates faster than he assimilates. But his peculiar ability may prove a great danger to his fellow-workers who attempt to imitate him. Because of his presence, any ill health on the part of other workers is quite certain to be attributed to habits and the conditions outside of the employment.

In a general way, naphtha (benzine) and benzol produce their harmful effects in a similar manner, except that the latter is regarded as by far the more active poison. Destruction of the red blood cells and of the blood-forming tissue, fatty degeneration of the heart, liver, kidneys, and blood vessel walls are the chief pathologic changes that have been observed. The presence of turpentine accentuates the kidney lesions. Headache, vertigo, dyspnoea, palpitation, loss of appetite, nausea and vomiting, anemia, skin eruptions, loss of weight, cardiac weakness, and finally, cyanosis, purpuric spots over the body with muscular twitchings and great exhaustion is the symptom complex spread out perhaps over several months' time or longer.

Death usually results from hemorrhages from the respiratory mucosa and perhaps other sources, paralysis of the heart, or is preceded by a gradual on-come of a moribund condition passing into coma, and sometimes delirium.

On September 13, 1915, our attention was called to the death of a youth who had died the day previously, the cause of death being assigned as "Myocardial degeneration, probably caused by naphtha and turpentine poisoning". We called on the physician who had charge of the case and he stated that the patient had first consulted him at his office six days previously. He gave his age as eighteen, single, American, and occupation as a sprayer in a filler and varnish room in a factory. He complained at that time of great weakness, headache, dizziness, periods of nausea, loss of appetite, tingling of extremities, constipation, and hemorrhagic spots over the body. He was very anemic and had lost about eighteen pounds in the past six months.

The systolic blood pressure was found to be 85, temperature 97.2 and pulse 69—weak and irregular.

On the second day thereafter, the patient was compelled to take to his bed with the above symptoms exaggerated. The blood-pressure was found to be only 75, the temperature below 94 (it could not be recorded accurately because the thermometer was graded down only to 94), pulse 90 and very weak and irregular. The urine was rather cloudy, specific gravity 1.022, acid in reaction, contained a trace of albumin, many hyalin casts, a few finely granular casts, and a few cylindroids. Blood count: leucocytes—12,400; polymorphonuclears—78.6%, small mononuclears—16.4%; large mononuclears—3%; and eosinophiles—2%. Two very capable physicians saw the patient with the physician-in-charge. One of them favored the diagnosis of naphtha poisoning, while the other was inclined toward a diagnosis of tuberculous meningitis. A spinal puncture was later performed, but the presence of tubercle bacilli could not be demonstrated. In fact, the spinal fluid was normal in every way. Three days later the patient passed into a delirium and died the following day.

On the occasion of one visit by the physician to the patient's home, he encountered three young men who came to visit the patient, and who were employed in the same department with him. They all described symptoms very similar to those of the patient, except in a milder form, and signified their intention of leaving the establishment.

As is customary in such instances, we called at the establishment where the patient had been employed and learned that for eight months he had been a sprayer in the varnish room. Each sprayer was covered by a large hood or cabinet of sufficient size to allow the presence of the article to be varnished and, indeed, the person of the operator, should he so choose. Each hood was equipped with an exhaust pipe with good exhaust. However, when the spray was directed against a flat surface, it would roll back and completely envelop the upper part of the operator's person, particularly if he were not careful of his position. It was observed that the workers paid little attention to being included in the escaping spray at frequent intervals, although such was not apparently necessary in order to perform the work.

It was stated that a substance was used as a cleaner which contained naphtha and there was a very perceptible odor of "quick driers" present, suggestive of a turpentine and benzine combination. No respirators were worn nor were any adequate instructions given or enforced supervision concerning the exposure to the spray.

We recommended the instruction of the workmen concerning the dangers connected with their employment and how to avoid them (leaving a pamphlet upon "Industrial Poisons"), work variations, careful supervision of ventilation, and periodic physical examinations of all such employees.

As the spray method of applying fillings, varnishes, colors, and paints, dissolved in various hydrocarbons for quick drying and even spreading, is becoming very extensively used, especially in factory work, and as the fine nebular clouds produced give opportunity for unusual diffusion of the volatile substances present, nearly all of which are poisonous, employers should adopt unusual precautions against the inhalation of these products by workers. The installation of confining cabinets, exhaust pipes, etc., is not sufficient. The workers themselves must be strictly supervised in their work and their tendency to expose themselves to the sprays. Undoubtedly many cases of in-

creasing fatigue, later exhaustion, have developed among this class of workers, causing most of them to quit the employment. On the other hand, some who have remained have passed into the purpuric and later moribund condition here described with fatal consequences.

Standards of endurance (physiological standards) for each of the three poisons discussed above have been determined by research workers abroad. These are submitted herewith. A concentration in the breathing atmosphere of the amounts of each substance designated will produce the results listed:

Benzine (naptha, gasoline, petroleum benzine)

.02 grams per litre of air will cause local symptoms.

.05 grams per litre of air is poisonous.

Benzol — (benzene)

.015 grams per litre of air is poisonous.

.042 grams per litre of air will kill dogs in 20 min.

Turpentine —

.008 grams per litre of air will cause local symptoms.

.006 grams per litre of air will poison healthy men in the space of
1 to 4 hours.

Acknowledgement is hereby made to Dr. Bruce E. Lindsey of Columbus, Ohio, for his assistance in collecting data of this case.

A SURVEY OF INDUSTRIAL HEALTH-HAZARDS AND OCCUPATIONAL DISEASES IN OHIO.

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Ohio State Board of Health.*

(Continued from the October issue.)

PART V.

HEALTH-HAZARDOUS PROCESSES.

THE SCOPE AND METHODS OF INQUIRY.

This section of the report takes up the description of particular processes in the industries and gives a summary of the findings for each. Under "Comments" are stated the principal corrective measures suggested to conserve the health of the workers in such processes. Most of these measures are those which our investigators discovered were being used in the better regulated plants.

It will be seen that this is a very important section of the report since it deals directly with working conditions. While instances are cited throughout this section of persons suffering from occupational diseases, the reader should consult Part VI. to learn the total number of such diseases which have been reported to the State Board of Health during the course of the survey.

From a hygienic point of view there were numerous establishments employing large numbers of wage-earners in which but two or three processes were considered health-hazardous, and these, perhaps, engaged but a small number of employees. On the other hand, many small establishments had most of their employees engaged in processes which were considered more or less dangerous to health. Hence, the size of, and number of employees in an establishment has no relation to the number of dangerous processes nor the relative number of persons engaged in the same.

While a lack of technical knowledge upon the part of the physician-investigator interfered more or less with his ability to describe processes, it did not interfere with his ability to observe the presence or absence of the 10 or 12 health-hazards for which he was seeking in each place, and to report upon the same according to the blank forms and the instructions under which he worked. While errors may have crept into the statements which follow they are invariably upon the conservative side and are usually errors of omission rather than commission. In summarizing, the rule has been followed to give the benefit of the doubt to the figures representing the better conditions. Where the number of "fair" or "bad" conditions only is mentioned, the balance are to be considered "good."

In nearly all the processes here described some reports were received from field workers too late for classification, but any unusual features from such reports have been mentioned herein. In order to have sufficient time to compile the mass of information collected, it was necessary to close up reports upon given processes when a sufficient number had been received. In most instances it is believed there have been enough places and processes described to give a fair representation of general average conditions.

A great many trade processes, both patented and secret, were disclosed to the investigators in full confidence of their proper usage, and we have endeavored in all respects to honor such confidences in the descriptions of processes given here or elsewhere. It has been the aim also to make this report one upon industrial hygiene and occupational diseases, and not one upon the description of manufacturing processes. Inquiries into manufacturing processes have also been made for the sole purpose of determining the amount of risk to the health of the worker. In nearly all cases, indeed, such information was voluntarily given to our representatives even before inquiries were made.

In all establishments visited, which are included in the summaries herewith, work was going on at the time of the visit of inspection. In addition to the observation of working conditions the investigators

questioned employes while at work, and examined for the more easily demonstrable "ear-marks" of occupational diseases, devoting as much time to this feature as seemed warranted in most places. The percentage of employers who objected to this, even without explaining to them that such was the prerogative of the Board of Health, under the enabling Act, was so small that this alone, if nothing else, shows the magnanimous attitude of the great body of employers throughout the State. Investigators were carefully instructed in this respect not to pass opinions upon working conditions to employes, nor to express to any employe who was questioned or examined any opinions concerning his or her state of health as determined by the physician-investigator.

The principle adopted throughout this report has been to conceal individual incidents, places, establishments, and even cities, as much as possible, and to render a summary of findings and opinions uninfluenced by local coloring. In nearly all places, names, addresses, ages, health histories, and work complaints, if any, of part of the employes were taken. Both older workers and old employes, as well as newer ones, were so consulted. In some places materials which workmen were handling and the substances of which they did not know (perhaps even employers did not know) were collected and sent to our laboratories for analysis.

For each process the following facts were ascertained:

1. The location of the process in the building.
2. What that part of the building was constructed for.
3. Whether such construction was generally hygienic, that is, amply spaced, properly enclosed against weather conditions, well lighted, properly heated, ceilings high enough, walls, floor and ceilings of a character to be kept easily clean, the convenience of toilets, and the amount of available space left to the workers.
4. The division of employes by sexes.
5. The approximate number of employes over 40 years of age, between 20 and 40, under 20 years, and under 16 years. The reason for the 20-year division is that the adult does not usually attain his or her full stature and development before the 20th year. In very few shops were workers under 16 years of age employed in any of the industries investigated. Here and there, especially during the summer seasons, children were found employed who acknowledged their ages as less than 14. Such instances, however, were very rare. Since there is a law under the administration of the State Industrial Commission governing the hours of employment for females, we did not check up this feature with any regularity.
6. A brief description of the process.
7. Were other processes in the same quarters, and, if so, the number of employes engaged in such. This is very important, since oftentimes one set of workers is subjected to the hazards of processes other than their own.

8. Were modern or crude methods used. Such were judged by using as a criterion the better known hygienic methods, but "crude" or "antiquated" methods is a term which was only applied to such places as were particularly endangering the health of employes when much better methods of accomplishing the same purposes were found to exist elsewhere.
9. The presence or absence of unions or workmen's organizations.
10. The attitude toward the workers. This was determined by the presence or absence of welfare efforts, workers' complaints; and the immediate interest which foremen or managers appeared to take in the employe. As is well known, the best efforts of an employer towards his employes de-

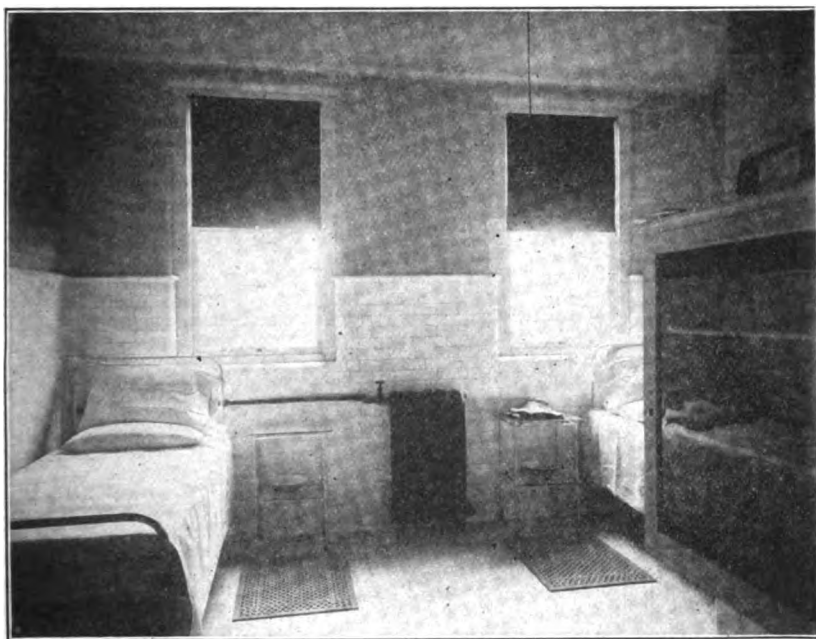


FIG. 35. A FACTORY REST ROOM.

This "sick bay" is maintained by a pottery company which employs a large number of girls.

pends very largely upon the personality, tact and attitude of the foreman who is immediately over them.

11. The type of workers, whether intelligent, responsible, and capable of understanding instructions or whether an ignorant and usually non-English speaking class.
12. The retention of workers, or the steadiness which they evinced in remaining at the place of employment.
13. The number of work shifts in 24 hours, the hours per shift, night work, overtime, noon time, and other recesses.
14. The approximate number of skilled and unskilled at the process.

15. The seasonal influence of the work, whether rush seasons and dull seasons characterize it.
16. The presence or absence of health appliances, that is, mechanical devices to promote ventilation and confine or remove fumes, dusts, etc., from the vicinity of the workers.
17. Health instructions, regarding the use of poisons and the avoidance of other health hazards which might be present. An attempt was made to ascertain how much attention was given to this by employers and foremen, and how well they were qualified in this field, which in most instances requires a thoughtful physician.
18. The presence or absence of health placards, inspiring aphorisms, legends, etc.



FIG. 36. THE EMPLOYER'S INTEREST IN THE WELFARE OF EMPLOYEES MAY WELL EXTEND BEYOND THE WORK PLACE.

Flying rings, and other equipment of a public playground, which is equipped and maintained by an industrial corporation.

19. The presence or absence of a proper or safe place in which to eat lunches.
20. The presence or absence of change rooms and lockers for clothing.
21. Sanitary provisions, including washing facilities, drinking facilities, and whether time was allowed for personal hygiene along these lines, particularly in poisonous, heat exposing, or dirty processes.

Below is a fac-simile of the card used by our field investigators to report working conditions and health-hazards to the office. A simple code enabled each feature mentioned to be designated "good," "fair," "bad," or "absent," while the blank spaces permitted of brief remarks.

DEPARTMENT REPORT
OHIO STATE BOARD OF HEALTH
Survey of Occupational Diseases.

City Date
 Establishment
 Department Location Good?
 Intended for Health of workers considered in construction
 Chief process Males Females Youths Minors
 Character of work
 (Other processes No. Employees)
 Modern methods? No. work shifts for 24 hours
 Hrs. per shift Night Overtime
 Noon time Other recesses
 Unions No. skilled Unskilled
 Attitude toward workers No. by age-groups
 Type of workers Seasonal influence
 Retention of workers
 Health appliances Health placards
 Health instructions Change rooms Lunch rooms
 Lockers Washing Showers Time allowed
 Toilets
 (over)

INDUSTRIAL HEALTH HAZARDS.

1. DUST from process: type..... breathed..... skin..... eyes..... control.....
2. DISORDER: workplace..... neighborhood..... homes..... DIRT: from process..... from negligence.....
Floor: type..... cleaning: O. K.: dry, wet, oil, during work hours?..... frequency.....
3. DAMPNESS: water..... steam..... humidity..... dryness.....
4. DARKNESS: during day..... reason..... artificial lighting: AEGO by the process..... efficiency.....
Injuries from contrasts, shadows, glare, ought colored glasses be worn?..... Are they?.....
5. IMPURE AIR: stillness, free flames without vents, salamanders, fumes, vapors, gases.....
Ventilation: of quarters..... of processes..... methods.....
6. HEAT: process exposure..... degree..... protection: mechanical.....
Personal (rest intervals, washing facilities, shower bath).....
7. COLD due to: process, heating method....., inefficient heating, drafts, sedentary work, alternation with heat.....
8. FATIGUE: laborious work, long hours, piece-work, speeding up, monotony, constant standing, constant strain, chairs without backs.....
Faulty postures..... jarring processes..... body pressure..... eye strain..... loud noises.....
Rest rooms, work variations, rest periods, recreation schemes.....
9. INACTIVITY: provisions for exercise..... for recreation..... 10. CAISSON WORK: air locks.....
11. INFECTIONS: crowding (irrespective of room space), common towels, cups, wash places, closets, spitting on floors, absence of cuspidors.....
Infectious materials, mouthed articles, wiping rags, oil, frequent trivial injuries, calluses, flying particles.....
Selected workers, physical exams, medical supervision, goggles, gloves, first aid and hospital arrangements.....
12. POISONS: kind and form..... sample taken..... Am't of risk.....
Workers ignorant, misbranding, lack of instructions, disregard of instructions, wrongful instructions, harmful regulations, moustaches, beards, eating at work or in work rooms, personal care, efficient medical supervision, gloves, respirators, clothes, lockers, washing facilities, eating places, water closets, MECHANICAL PROTECTION.....
13. ALCOHOLISM: drinking water "good", properly cooled, plentiful; liquors permitted during work; subjection to dust, bad air, fumes, gases, vapors, heat, cold, dampness and poisons; saloons near, employer mindful, home gardens, workers' efficiency department.....
14. VENEREAL DISEASES: common handling of articles, sexes working together, immoral atmosphere.....
15. APPEARANCE OF WORKERS.....

Signed

In the summaries which follow it will be found that the same terms and expressions have been used again and again. If value of repetition means anything, it is hoped that these repetitions will effect their purpose, and, where indicated, bring about the remedial measures necessary.

Some facts stand out: Owners and managers of plants hygienically well-regulated and who have been giving attention to the same for years, perhaps, often refuse to believe that conditions dangerous to the health exist in other plants engaged in the same lines as their own. Again, because owners and managers are not hygienists nor physicians, they many times fail to correlate causes and effects and to have knowledge of or to see occupational complaints and diseases which are right before them. A solution of this situation, we repeat again, is that the employer have his own physician at hand, who, according to the risks involved, shall make periodic inquiries and render suggestions. There is no question, however, but that a considerable amount of intelligent thought has been directed to these matters in the majority of the places investigated.

PART VI.

CLASSIFICATION OF OCCUPATIONAL DISEASES AND COMPLAINTS BY INDUSTRIES AND PROCESSES.

There is included in this Part a summary of the occupational diseases and disabilities which were reported to the Division of Occupational Diseases during 1913 and 1914 (with but few exceptions all were reported between July, 1913, and November 30, 1914). Duplicate reports have been excluded and only cases are included, which were personally seen and reported by physicians, and for each of which there is a personal record in the files of the office, with the exception of a few instances where employers themselves reported specific cases.

The following have been the sources of information:

(1) Deaths from Occupational Diseases.—These are very difficult to obtain any record of, principally because some terminal complication is the immediate cause of death. The following is taken from the death certificates of the State Bureau of Vital Statistics, and is for *lead poisoning* only. There is no way, from the certificates, to ascertain which were occupational in character and which were not, but it is very probable that practically all were due to occupational poisoning (only those of 1913 have been included in the large table):

RECORDED DEATHS FROM LEAD POISONING, OHIO, 1909-1913.

<i>Occupation.</i>	<i>1909</i>	<i>1910</i>	<i>1911</i>	<i>1912</i>	<i>1913</i>	<i>Total.</i>
Artist	1	..	..	..	..	1
Farmer* .....	..	..	..	1	2	3
Laborer .....	..	2	..	..	..	2
Lead Worker .....	..	..	1	..	1	2
Machinist .....	..	1	1	..	..	2
Merchant .....	..	..	..	1	..	1
Miner .....	..	..	..	1	..	1
Painter	6	6	6	10	11	39
Potter .....	..	1	..	1	..	2
Printer	1	..	..	1	1	3
Rubber Worker .....	..	1	1	..	..	2
Tinner .....	..	1	..	..	..	1
Totals	8	12	9	15	15	59

(2) The records of dispensaries, hospitals and charitable institutions in five of the largest cities were examined. They gave very little specific or trustworthy information and most of this was prior to 1913, and too old for use. There was no filing of "Occupational Complaints." One investigator commented upon this in one of the largest hospitals as follows: "Because of manner of keeping records it was very hard to ascertain whether diseases could be attributed to occupation; 3,400 histories were looked over." In short, what should have been a very valuable source of information proved practically worthless. The reasons for this and suggestions for meeting the situation are taken up in Part VIII. A large percentage of the adult patients with medical afflictions in these institutions are occupationally afflicted—some partly so, others wholly so.

(3) The reporting of cases by company physicians according to certain legal requirements mentioned elsewhere yielded a total of 68 cases, all lead poisoning. Unfortunately the "lead law" is so narrow—it specifies "manufacturers" only of certain lead compounds, thus omitting compounders, mixers, users, etc.—that less than half a dozen establishments in the state can be considered as coming under it. In fact all of the above mentioned reports were received from the physicians connected with four establishments, the greater part of them during the first few months of the survey. We believe the reporting law has been lived up to quite carefully by them, and with the gradual

* One farmer died, according to a note on the death certificate, from "Lead poisoning from accidental gun-shot wound of 26 years standing". This tendency for lead, stored in the body, to go into solution years afterward and produce poisoning is well known. This instance, of course, was not occupational.

falling off of such cases there has been noted a lessening in the severity of the symptoms which the physicians reported.

(4) The Occupational Disease Reporting Law covering all physicians has proved very much of a failure. Some score or so of cases have been yielded from this source. Even these have depended solely upon the philanthropical motives and self-sacrifice of the physicians who reported them, since there is no remuneration for such services, nor is there any penalty attached for ignoring the law. Even the best intentioned physician finds it beyond him to take the time to get the information together which the reporting blank requires, and then five or ten minutes more to fill out the blank and pay the envelope and postage cost out of his own pocket. In addition he feels that he may be jeopardizing his patient's relations with his employer and so sacrifices the good of the other workers to the immediate good of the individual patient. In this respect we may say that our experience with employers throughout the state is that not one in fifty would countenance the thought for an instant that he is "running a house of manslaughter," but would welcome any such information from the physician directly and, furthermore, would be glad to get any suggestions which the physician or the State Board of Health might be able to furnish. It is pointed out, also, that such reported information cannot be made use of for any legal purpose, while it has always been considered strictly confidential in this office. If physicians were allowed a dollar or two for reporting the details of an occupational disease—much less than they are allowed for doing the same for an average insurance application—it is more than likely that the State Board of Health would soon be busy enough with the handling of such reports. While it is true that the average physician does not see many cases of lead poisoning, for instance, almost anyone questioned upon the subject can cite a case of bronchitis, or nephritis, or tuberculosis, a considerable part of the cause for which has been some industrial health-hazard, and usually one the seriousness of which any employer would be glad to have brought to his attention.

(5) Hence the majority of the cases tabulated below have been the findings of the special staff of physician-investigators employed by the State Board of Health. The cases reported from all sources have been carefully classified by the Statistical Department. Reported cases were of four types: (1) "positive," in which the specific symptoms and signs were present as well as the specific health-hazard or hazards; (2) "tentative," in which disability was present but enough specific symptoms or signs were not present to make a positive diagnosis, although the hazards were present; (3) "past cases," in which

the specific symptoms or signs were present prior to the advent of the year 1913; and (4) "hearsay cases," in which information which could be regarded as authentic was at hand as well as the actual evidence of the hazards. Only the first two types of cases have been included in the figures. In the last column the director of the survey has made an attempt to portray the probable prevalence of such cases as have been enumerated, basing his opinions upon the number of "past" and "hearsay" cases reported in by investigators, the extent and character of the health-hazards present, and his industrial and professional experience. This table may be taken as very conservative in that it does not give all of the occupational diseases which occurred under each industry, simply because no intensive or prolonged investigation was made of any industry so that only such cases as were found present at the particular time of investigation, either in the plants investigated or in the community, have been listed; these makes up the bulk of the figures, and to these have been added all cases reported by other physicians. For instance, in the Clothing Industry no cases of occupational neurosis (brachial neuritis, or arm palsy) is reported, although dispensary experience shows that it is quite common among ironers and pressers, of whom there are thousands in the cities of the state. Such information, however, is to be found under the description of the various processes in Part V.

In the last column the signs have the following significance:

- (+) an occasional case occurs.
- a small percentage of cases occurs (say 1 to 5% of those engaged).
- ++ a larger percentage of cases occurs (say 5 to 10% of those engaged).
- +++ a still larger percentage of cases occurs (say 10 to 15% of those engaged).
- ++++ a large percentage of cases occurs (say 15% or more of those engaged).

The tuberculosis cases listed ("industrial tuberculosis") have been very largely received through a special arrangement with the Cleveland Board of Health whereby for ten months during the year 1914 the moral hazards, domestic and housing hazards of occupied persons who were suffering from tuberculosis were carefully compiled. Then industrial hazards, as found by investigators, were correlated with the individual cases, with the result that the numbers specified after each industry are to be considered as "industrial tuberculosis," more or less engendered and promoted by such occupation. Some of the cases were also reported from Cincinnati, and a few from other places.

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS OF CASES.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Positive.	Tentative.	Probable Total.
Agricultural Implements	Painting, enameling	Benzine poisoning	3	.....	+
	Painting, bronzing	Lead poisoning	4	1	+
	Metal grinding	Siderosis	2	.....	+
	Metal grinding	Tuberculosis .....	.....	2	+
Automobiles and Parts	Varnishing	Conjunctivitis	1	.....	+
	Tempering	Cyanide ulcer .....	.....	.....	+
	Machine shopping	Dermatitis (lard oil)	1	.....	+
	Welding	Eye strain	1	.....	+
	Adjusting carburetors	Gas poisoning	1	.....	+
	Carpentering on primed work	Lead poisoning	2	.....	+
	Painting, sanding, etc	Lead poisoning	72	5	+
	Tempering	Lead poisoning	2	1	+
	Not specified	Lead poisoning	3	.....	+
	Metal grinding, polishing	Siderosis	8	.....	+
	Painting, varnishing	Turpentine poisoning .....	.....	.....	+
	Various processes	Tuberculosis	17	.....	+
	Melting	Lead poisoning	1	1	+
	Various processes	Tuberculosis	5	.....	+
Babbiting Metals and Solder	Brazing	Brass chills	6	.....	+
	Molding	Brass chills	1	.....	+
	Painting, varnishing	Lead poisoning	2	.....	+
	Miscellaneous	Tuberculosis	1	.....	+

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Continued.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Posi- tive.	Tenta- tive.	Probable Total.
Boots and Shoes.....	Blackening, polishing	Amyl acetate poisoning	1	1	+
	Paper box making.....	Appendicitis	1	8	+
	Cementing	Benzene poisoning	1	.....	+
	Finishing	Benzene poisoning	1	.....	+
	Blackening	Dermatitis	1	.....	+
	Closing	Dermatitis	1	.....	+
	Lasting	Glue fumes (?) intoxication.....	1	.....	(+)
	Box toe making.....	Methyl alcohol poisoning.....	1	.....	+
	Fitting and lasting.....	Methyl alcohol poisoning.....	4	.....	+
	Polishing	Fume poisoning	2	.....	+
Boxes, Fancy and Paper.....	Various processes	Tuberculosis	3	2	+
	Sewing	Bronchitis	1	.....	+
	Paper box making.....	Dermatitis (glue)	1	.....	+
	Gas producing	Gas poisoning	1	.....	+
	Painting, varnishing, etc.....	Benzene poisoning .....	.....	2	+
Brass and Bronze Products.....	Brass founding	Brass chills	78	.....	+
	Buffing, polishing	Brass itch	7	.....	+
	Acid dipping	Dermatitis (acid)	1	.....	+
	Enameling	Enamel fumes poisoning .....	.....	1	+
	Brass founding	Gas poisoning .....	.....	.....	+
	Brass founding	Lead poisoning	1	.....	+
	Soldering	Lead poisoning	2	2	+
	Plating	Rhinitis	1	.....	+
	.....	.....	4	.....	+
	+

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Continued.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Posi- tive.	Tenta- tive.	Probable Total.
Cooperage Copper, Tin, etc.....	Soldering	Lead poisoning .....	.....	2	+
	Painting, varnishing	Turpentine poisoning	1	.....	+
	Miscellaneous	Tuberculosis	1	.....	+
	Coopering	Tuberculosis	4	.....	+
	Machine shopping	Lead poisoning	1	.....	+
Cordage, Twine, Jute.....	Soldering	Lead poisoning	2	.....	+
	Galvanizing	Zinc poisoning	1	.....	+
	Tinsmithing	Tuberculosis	2	.....	+
	Various processes	Bronchitis	3	.....	+
	Combining, stranding	Dermatitis (oil)	2	.....	+
Cutlery and Tools.....	Various processes	Tuberculosis	1	.....	+
	Tempering	Lead poisoning	7	1	+
	Metal grinding	Occupational neurosis .....	.....	1	+
	Metal grinding	Siderosis	4	.....	+
	Various processes	Tuberculosis	3	.....	+
Dry Cleaning and Dyeing.....	Dyeing, cleaning	Benzene poisoning	3	.....	+
	Dyeing, cleaning	Benzene poisoning	4	1	+
	Dyeing, cleaning	Dermatitis	1	.....	+
Electrical Apparatus, etc.....	Miscellaneous	Tuberculosis	1	.....	+
	Dry batteries	Anthraxis .....	.....	1	+
	Brass founding	Brass chills	12	.....	+
	Mixing chemical	Burns (zinc chloride)	2	.....	+
	Incandescent lamps	Conjunctivitis, eye-strain	1	.....	+

Pitching	Dermatitis (pitch)	1	+
Dry batteries	Eczema (carbon?)	2	+
Dry batteries	Epitheliomata	14	+
Lead burning	Lead poisoning	92	+
Storage batteries	Lead poisoning	1	+
Soldering	Lead poisoning	1	+
Carbon brushes	Paraffin poisoning	1	+
Metal grinding, polishing	Siderosis	18	+
Various processes	Tuberculosis	2	+
Babbiting, molding	Lead poisoning	1	+
Enameling	Dermatitis	8	+
Enameling	Lead poisoning	2	+
Pulverizing charcoal	Benzene poisoning	1	+
Lead founding	Bronchitis	1	+
Nitroglycerine manufacturing	Lead poisoning	1	+
Miscellaneous	Nitroglycerine poisoning	1	+
Mixing, grinding	Tuberculosis	1	+
Various processes	Pneumonoknosis	1	+
File cutting	Tuberculosis	1	+
File cutting	Blepharitis	1	+
Tempering	Lead poisoning	2	+
Painting	Lead poisoning	1	+
Pressing	Occupational neuritis	2	+
Mixing chemicals	Antimony poisoning	1	+
Brass founding	Brass chills	1	+
Polishing	Bronchitis	1	+
Blacksmithing, etc.	Deafness	1	+
Welding	Dermatitis	2	+
Electroplating	Eczema (chronic)	1	+
Tempering	Furunculosis	1	+
Die Casting	Lead poisoning	2	+
Founding	Lead poisoning	1	+
Painting	Lead poisoning	3	+
Soldering	Lead poisoning	8	+
Tempering	Lead poisoning	2	+
Founding	Rheumatism (chronic)	1	+

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Continued.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Positive.	Tentative.	Probable Total.
Fur Goods Furniture and Cabinets.....	Tempering	Siderosis	65	.....	+
	Various processes	Tuberculosis .....	.....	.....	+
	Making up garments.....	Conjunctivitis	1	.....	(+)
	Shellacing, varnishing	Benzene poisoning	1	4	+
	Polishing	Dermatitis	2	.....	+
	Veneering	Dermatitis	8	.....	+
	Painting, varnishing	Lead poisoning .....	.....	.....	+
	Various processes	Tuberculosis	6	1	+
	Galvanizing	Brass chills	17	1	+
	Gas making	Gas poisoning .....	.....	.....	(+)
Galvanizing Gas Producing Glass Cutting, Staining, Art.....	Art glass work.....	HFl poisoning	3	.....	+
	Painting	Lead poisoning	1	.....	+
	Assembling	Lead poisoning .....	.....	1	(+)
	Etching glass	Rhinitis	1	.....	+
	Metal glazing	Rhinitis	1	.....	+
	Mixing ingredients	Dermatitis (arsenic)	1	.....	+
	Decorating	Dermatitis (benzine)	1	1	+
	Mixing ingredients	Epistaxis	2	.....	+
	Gas producing	Gas poisoning .....	.....	1	+
	Lead putty making.....	Lead poisoning	1	.....	+
Hats, Fur and Felt.....	Mixing ingredients	Lead poisoning	5	.....	+
	Various processes	Tuberculosis	4	.....	+
	.....	Tuberculosis .....	.....	.....	+
	.....	Tuberculosis	2	.....	+

(To be concluded with the December issue.)

THE HYGIENE OF SPECIAL PROCESSES.

E. R. HAYHURST, A. M., M. D., *Director, Division of Industrial Hygiene,
Ohio State Board of Health.*

(Continued from the October issue.)

RUBBER. — CALENDERING (INCLUDING WARMING MILLS).

This process follows that of the mixing mills. Compounded rubber is introduced into the rolls of the warming mills and of the calenders which further perfect the material and grade it down into sheets of required thickness. Oftentimes also the calenders are used to press the rubber into cloth fabric, which is called "frictioning".

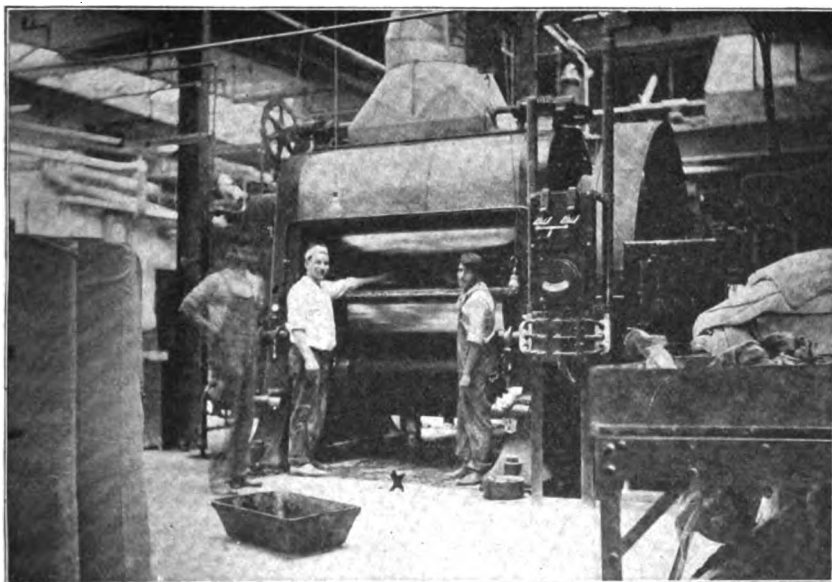


FIG. 55. RUBBER CALENDER.

Note hood above which draws off heated air, odors and fumes. Completely equipped with safety devices, including rubber floor mat "X".

In 12 places in which this process was investigated there were 793 wage-earners, all males. The welfare attitude of the employers towards the workers was considered to be good in 9 places, fair in 2 others, and not so in one. In 5 places the workers were of an intelligent type, while in 7 they were very largely ignorant foreigners. Retention of workers was good in 7 places and at least fair in the balance. Health appliances consisting of hoods and stacks with exhaust fans, covering the calenders and mills, were excellent in 2 places. While these were absent from the balance, other health appliances such as room

exhaust fans and ventilation schemes were present in 5 places. In 5 others no attempts were made to remove dusts or fumes arising from the process. The day averaged from 10 to 11 hours in 8 plants, with 30 minutes for noon in 10 plants. In the others the day period was 8 to 10 hours, and the noon recess 1 hour. Some overtime was the rule in 3 places. A certain per cent. of men at this process were at least semi-skilled, but about 80 % were unskilled. Rarely were men over 40 years of age seen. There were, however, very few youths under 20. Working quarters were modern and of hygienic construction in 9 places, fairly so in 1 other, and bad in the remaining 2, due to low ceilings, crowded machinery and the presence of ulterior processes. The process was in the same room as the mixing mills in 5 places, though, in some, well separated.

A fair amount of *soapstone dust* was present in the atmosphere in all places. In most of the places it could be considered almost negligible as a health-hazard. Dust *accumulations* about the floors and ledges were present in all places, although daily cleaning, usually by wet methods, was the rule. *Dampness* was no factor. Nine of the places were well-lighted, and 3 only fairly so. Room *ventilation* was good in 3 places, but only fair in 9 others, due to poor location and inadequate or absent ventilating appliances. *Heat* from the rolls was found bad in 2 places, fairly so in 5 others, and a negligible factor in the remaining 5. *Fatigue* factors were moderate and in the shape of limited piece-work, monotonous hum of machinery, with evident speeding up in at least 1 place. The process is also fairly noisy. The danger of contracting *communicable diseases* was considered bad in 2 places, fairly so in 7 others and practically nil in the 3 remaining. The hazards here were the use of common drinking cups, improper washing places and toilets, spitting on the dusty floors, the absence of cuspidors, the lack of physical examinations and of first-aid provisions. *Occupational poisoning* is hardly a hazard in this process, but dermatitis or eczema, due to the dust and to the handling of rubber, may afflict the more susceptible. On the other hand benzine fumes were fairly strong in 2 places. Industrial *alcoholism* was favored in 8 places because of inefficient drinking water facilities, and the influence of the factors above mentioned.

In only 3 places were all workers healthy appearing. Complaints of the workmen were the benzine fumes, a considerable part of which came from open-top cement cans. These fumes, because of the heat, volatilized greatly. In most places benzine was little used in the process. No cases of occupational poisoning were found.

RUBBER. — TIRE-BUILDING.

This process consists in the making of casings for automobile and bicycle tires by the applying of layers of rubber fabric upon wheel-shaped molds; to these are cemented the beads, cover layers, etc. It may be all hand work, the operator sitting or standing before the mold, mounted upright on a pedestal, and carefully stretching the fabric as he revolves the "wheel". In some places more than half of the work was being done by mechanical application of the fabric to the molds, called "machine building".

This process was investigated in 13 places employing 4,135 wage-earners, all males. The workers are among the most skilled in the rubber industry, while the attitude of employers toward them seemed to be excellent in 12 places and at least fair in the other, so that the retention of the men seemed to be good

every place. Health appliances consist of means of ridding the atmosphere of benzine fumes and of reducing the laborious character of the work. In 3 plants, only, were attempts made to limit the fumes by so much as using covered containers. Privileges of sick benefits were available to part of the workers in 2 plants. The work day consisted of 8 hours in 2 places and 9 to 10 hour shifts in 8 places and 10 to 13 hours in 3 places, with a noon recess of 1 hour in 2 places and 30 minutes in 10 places. In 3 places, overtime was an occasional requirement. Fully 95% of the workers were between 20 and 40 years of age; there were some youths under 20, while older men were usually found working in small plants. The work rooms were hygienically constructed in 11 places, but not so in two. Many half-auxiliary processes, such as bead-making, buffing, book-making, and inner tube making, were, as a rule, carried on in the same room. This helped to add to the benzine content of the air.

Dust in the shape of soap-stone was present to a fair extent in all places. The quarters were kept well *cleaned* in 11 of the places, while dust and rubber scraps were allowed to collect in the other two.

Dampness was no factor. *Light* was invariably good. In all places the odor of benzine was detectable and in 5 its concentration was bad. Invariably open windows were depended upon largely for *ventilation*. Fans and air-agitators were uniformly absent as were also room air-exhaust schemes. Two places were equipped with air-conditioning systems for use in winter for supplying tempered air, but these did not remove contaminated air. *Heat* was no factor. On the other hand the effects of *cold* draughts from open windows were a hazard in practically all places. *Fatigue* was more than a fair hazard in most places due to hurrying piecework and, in some places, constant standing in strained positions, faulty postures, jarring processes, pressures against the body, and the lifting and carrying of heavy molds. The contraction of *communicable diseases* was favored in 3 places, fairly so in 5 others, and could be considered negligible in the remaining 5. The chief reasons were the use of common drinking cups, inadequate washing facilities and closets, spitting upon the floors, the absence of cuspidors, and, to some extent, the crowding together of large numbers of workmen without medical supervision. In some places adequate first-aid arrangements were absent, though bruises and sprains are frequent in the process. There is some likelihood of the direct spreading of venereal disease through the common handling of the same article. The *poisons* to be feared are benzine, antimony and perhaps lead (the last two from handling rubberized fabric). In no place was benzine odor absent, while in 9 of the 13 it was strong enough to cause symptoms. The process necessitates using it with sponges in an open manner, and it is also a solvent for the cements which are applied, usually, by the bare hand, occasionally also with brushes, hence its control is difficult. Continual changing of the air in the room by mechanical means, air-agitators and the keeping of the artificial temperature down in the winter months would help greatly; also the substitution of closed containers with a pressure-valve benzine emitter in place of the open cups now used. Antimony dermatitis was an occasional complaint. Industrial *alcoholism* was favored in most of the plants through inadequate drinking water facilities, particularly, when combined with the depressing effects of benzine fumes and hard work.

In this large body of workmen it was of course possible to find some anemic or sickly *looking* workers in practically all the places. The chief *com-*

plaints were headache, dizziness and stupefaction, due to breathing benzine fumes. Many claim that this bothered them only at first. We have commented upon this toleration to poisons in a previous Part as decidedly unphysiological. Many cases of anemia were seen which were undoubtedly due to the chronic effects of benzine. The workers' disregard of the fumes and the tendency of many of them to scoff at their effects is unfortunate and can only be met by enlightenment, particularly upon degenerative diseases.

RUBBER.—STEAM VULCANIZING.

This process is also called "curing", and in many plants the rubber tires were subjected to two steam cures, the first, when the tire was partly built, called "semi-curing", and the second, when the tire was completely built, "final curing". Inasmuch as the curing used to be done in cylinders sunk in pits in the ground (usually in the basement), the "semi-cure" process room retains its name, "the pit". Tire casings are placed in iron molds within the steam cylinders, steam admitted for a proper length of time, then shut off and the cured tires mechanically removed.

The process was investigated in 15 places, engaging 733 wage-earners, all males. The welfare attitude towards workers seemed good in 10 places and at least fair in the balance. The workers were of an intelligent American type in 6 smaller places, while the balance (mostly large places) employed a good grade of foreign labor. The retention of workers seemed good in 6 places, fair in 8 more, and in 1 not so. Health appliances consisting of a hood and vent stack over the openings of the cylinders, air conditioning system for the work room, or air agitators and floor treads or drains to remove water, were good in 3 places, fair in 4 places, and all entirely absent in 8 places. In some of the better places, boots, aprons, and gloves were provided, while others used a procedure which permitted a very little escape of steam, water and excessive heat. The work day was 8 hours in 2 places, 9-10 hours in 13 places; the noon recess was 1 hour in 3 places, and $\frac{1}{2}$ hour in 11 places. Overtime was frequent in 5 places. The work is not skilled beyond the immediate supervision of the foreman. Very few workers were seen over 40 years of age, and practically none under 20. The work quarters were of hygienic construction in 7 places, fairly so in 2 others, and poorly so in the remaining 6, due, principally, to low ceilings and crowded floor or basement, while in 2 places 1 or more additional kinds of work were being carried on.

Dust, due to soapstone, was a bad factor in 3 places, and fairly so in 4 others, while in the remaining 8 there was none, due to a difference in procedure. In 1 place a laudable measure was the wetting down of the soapstone used. Dust and waste-product *accumulations* were bad in 3 places, fairly so in 4 others and absent in the balance. Water, steam and *humidity* were bad in 3 places, fairly so in 8 places, but practically absent in the remaining 4. *Light* was good in 9 places, fair in 5, and poor in 1. Room *ventilation* was good in 5, fair in 4, and poor in 4 places, the latter due largely to location, resulting in closeness, stuffiness, and still air; also to the absence of artificial ventilation schemes. *Heat* was determined as bad in 4 places, fair in 7, and satisfactory in 4. In only 1 place was a shower bath at hand. *Cold* and draughts were bad in 2 places, fairly so in 2 others, and but little factors in the remaining 9. The work is rather *laborious* and on this account big powerful workmen were

usually seen. In three places the piecework was promoting exhaustion, while in 1 large plant the men, though working in 8-hour shifts, were hurrying along, many of them, half stripped, and dashing from steam heated to draughty areas in what appeared to be a killing pace. Some places were very noisy. The contraction of *communicable diseases* was highly possible in 5 places and fairly so in 8 others, and practically nil in 2 others. The hazards were common drinking cups, improper washing places and closets, promiscuous spitting, absence of cuspidors, lack of first-aid provisions and of the physical examination of workers. Venereal diseases have a slight chance for spreading due to the common handling of the same objects. *Poisoning* is not a real factor in the process, except the escape of fuel gas fumes, which seemed bad in 5 places, fair in 5, and no factor in 5 others. Industrial *alcoholism* was much favored in 2 places, and fairly so in 7 others, due, not so much to faulty drinking water facilities, as, to the depressing influences of humidity, dust and fatigue.

In 6 places no sickly looking workers were observed, but in the remaining 9, one or more of such should at least have had a physical examination. In several places *complaints* were made of the heat, or cases of heat-prostration, and of heat colic and cramps. *Comments.*—In certain places the escape of water and steam should be better controlled, and, where locations have been unfortunate, high temperature should be contravened by air blasts, electric fans, etc., as is done in steel mills and elsewhere. Other corrections are suggested in the hazards above mentioned.

RUBBER.—DIPPING.

In this process, molds of gloves, finger cots, etc., are dipped, usually mechanically, into vats containing rubber dissolved in benzine, whereby, when the objects are raised from the vats, a thin coating of rubber adheres to the mold. This process is repeated several times, according to the thickness of objects required. Great precautions are necessary to avoid fire and explosions.

This process was investigated in 11 establishments in which 49 wage-earners, all males, were found so engaged. The workers were either Americans or foreigners of fair intelligence in all places. Retention at the process was fair in 6 places and good in 4. Health appliances, which consist in the provision of hoods with exhaust pipes, curtains, air forced into the rooms under pressure and slatted floors with exhausts beneath were found good in 5 places, fair in 5 more and absent in the remaining 1. The workday was 10 hours in 10 places and 9½ in 1 place; the noon recess was ½ hour in 9 places and 1 hour in 2 places. In addition, the work is of such a nature that an employe is required to be within the room only a few minutes at a time. Probably from 1/3 to ½ of the workday is spent within the dipping room. Overtime was resorted to in 3 places. The work requires no particular skill. All workers were under 40 years of age. The rooms were of hygienic construction in 4 places, fairly so in 3 places and not so in the remaining 4. The quarters were always spacious in proportion to the number of workers employed. In 5 places cement mixing, vapor cures and some other processes were carried on in the same room. These were all small places.

Dust is foreign to the process and was not noted in 9 places, but in 2 others a considerable amount of soapstone dust was observed from other processes. The quarters were *clean* in 7 places, fairly so in 2 others and not so

in the remaining 2. *Dampness* was no factor. *Light* was good in 7 places and only fair in the remaining. In all places benzine odor was plainly detectable. This amounted to a fair health-hazard in 8 places and a bad risk in 3. Its concentration was in proportion to the absence of health appliances to remove or confine the vapors. Although the process requires warmth, this was not enough to be an unhealthy factor in but 1 place. The rooms were usually close and still in order to keep out dust. *Fatigue* was no factor. The contraction of *communicable diseases* was a fair hazard in 8 places and especially so in 1, due to the use of common drinking cups, improper wash-places and closets, promiscuous spitting, absence of cuspidors, some common handling of

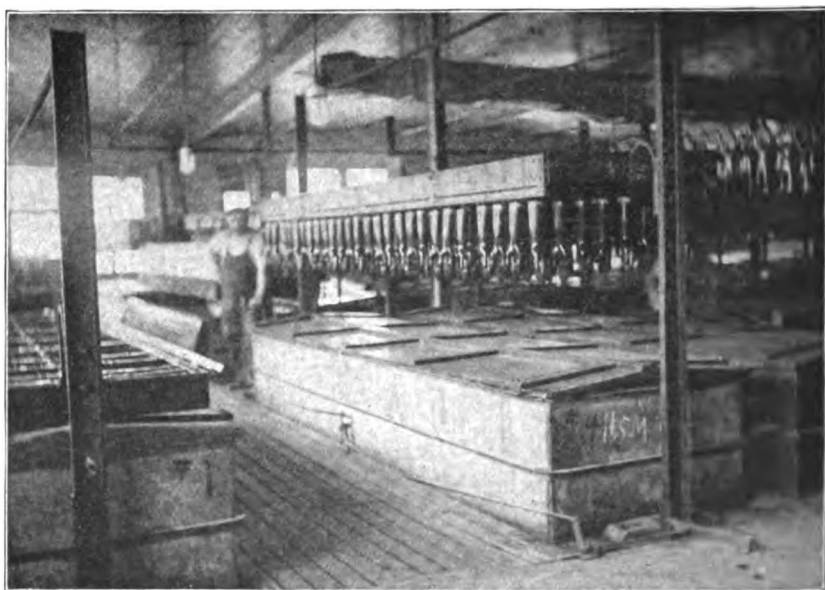


FIG. 56. RUBBER "DIPPING ROOM."

Gloves are made by dipping molds into solutions of rubber dissolved in benzine. The benzine tanks are covered when not in use. The floor is latticed with an exhaust system beneath to draw off the heavy benzine fumes.

articles and the lack of medical supervision. In the remaining 2 places such factors were nil. Benzine was the only *poisonous* substance used. It constituted a bad hazard in 7 places and fairly so in the remaining 4, especially if an employe were required to remain more than 15 minutes or so in the immediate vicinity of the uncovered dipping vats and the dripping frames above. The process rarely required this. When not in use each separate vat was hooded to prevent waste by evaporation. Industrial *alcoholism* was somewhat favored in 7 places and very much so in 3 others, by the lack of adequate drinking water facilities and the depressing influences of the heat and vapors above described.

In practically all places some pale and *unhealthy looking* workers were seen, especially among the older employes. The chief complaints of the workers were dizziness, loss of appetite, tiredness and, occasionally, "benzine jags," due to breathing the fumes. One positive and 2 tentative cases of chronic benzine poisoning were seen. *Comments.*—Health appliances (see above) should be provided in all places where dipping is done on any scale. While in the dipping room, and for a few minutes before, the exhaust ventilation system should be set in motion.

RUBBER.—BUFFING.

In this process rubber tire casings partly built are roughened up by revolving them on a wheel and holding a coarse file against them. Other semi-hard rubber objects are also buffed, usually by pressing them against a revolving emery wheel. The object of roughing up the rubber is to give surface for the cement which is later applied in order to put on further coats or covers.

The process was investigated in 6 establishments employing a total of 168 males and 6 females. The workers were largely foreigners. The work seemed uninviting and retention of workers at the process was not good. But 10 of the entire number of workers, including the 6 females, had any mechanical protection from rubber dust. The workday varied from 10 to 12½ hours; the noon recess being ½ hour in 5 places and 1 hour in 1. The work was unskilled. But 4 workers were observed over 40 years of age, while a considerable number were under 20. The work-place was hygienically constructed in 4 places and only fairly so in 2 others. It was in the same room with tirebuilding in half of the places.

Opportunities for inhaling rubber *dust* were bad in 4 places and fair in the 2 remaining. But 1 place supplied respirators and these were unwillingly used. Many of the workers were as black as coal heavers, due to the dust. In all places except 1, the dust *accumulations* on the floor and vicinity were considerable. Here and there persons were constantly sweeping up and using only a dry method. In some places the rubber was buffed in a semi-moistened condition so that dust was very much reduced. *Dampness* was no factor. *Light* was good in all places. *Temperature* was no factor. The general character of the air in the room, outside of the dust factor, was good in only 1/3 of the places. *Fatigue* was a fair factor in all places, due to the arduous character of the work, piecework, speeding up, monotony, constant standing (except for a very few, including the 6 females), constant strain, the very faulty postures of leaning over with a file pressed across the thigh, the jarring character of the work and the steady application. The contraction of *communicable diseases* was a fair to bad risk in 2/3 of the places, due to the use of common drinking cups, improper wash-places and closets, spitting upon the dusty floors, absence of cuspidors, lack of physical examinations, medical supervision, goggles, gloves and first-aid provisions. *Poisoning* from lead which is in the compounded rubber is a possibility, while benzine fumes were present to a fair extent in most places. The risk of lead poisoning may be considered as in about direct proportion to the dust inhaled and ingested. The workers could be very little blamed for personal carelessness where the dust flew all over them. Proper washing facilities, lockers and eating quarters were present in but 1 place. Industrial *alcoholism* was favored by such factors as fatigue, dust, and perhaps poisoning.

Many of the workers *appeared* very tired. They *complained* bitterly in some instances of rubber dust, "friction" smoke and long hours. In most places the process was acknowledged health-hazardous by the management, while several places were arranging for dust control systems. One questionable act of the workers was the holding of a bare handful of cement dissolved in benzine, and in at least one instance, benzol while applying it to the revolving surface of the tire.

RUBBER.—INNER TUBES FOR TIRES.

Inner tubes are made, generally, of almost pure rubber by lapping long strips of rubber around an iron rod of the proper size, or by butting the edges together on a table top. The rubber is made to adhere to itself by moistening with benzine or benzine cement (rarely benzol). The long tube is next wrapped or bandaged with a wet strip of cloth and then steam cured (hazard somewhat less than steam vulcanizing, described elsewhere), after which the ends are spliced together, as a rule, by a cold cure process. Although a difficult procedure, steam cure for splicing is sometimes used. Only the first process, viz., lapping or edge butting, is considered here.

This was investigated in 8 plants and engaged 389 males and 201 females, usually only the one or the other sex being employed in a given plant. The work requires a little skill and a fairly intelligent type of workers was the rule, the females in particular being largely so. The workers appeared to stay at the process fairly well in but 3 places. Health appliances to remove or confine benzine fumes were absent in all places. The work day was 8 hours in 1 place, and between 9 and 10 hours in all the balance, with a half hour noon recess. Overtime was frequent in 3 places. A vast majority of the workers were youths, and men and women under 40 years of age; not more than 10 were above this age. The work rooms were constructed hygienically in 6 places and fairly so in the 2 others. In 3 places several other processes were in vogue in the same room.

Soapstone *dust* was a fair hazard in 6 of the 8 places. The *cleanliness* of the quarters was good in 5 and fair in the other 3 places. *Dampness* was no factor. *Light* was good in all places. The general character of the atmosphere was good in 1 place, fair in 3, and bad in the remaining 4, due to the closing of windows to keep out dusts and drafts, and to the absence of any artificial ventilating systems, fans, etc. *Heat* is not a factor of the process itself, but in 1 place the quarters were unusually warm, due to their location over the vulcanizing room below. *Fatigue* is a fair hazard, due to piece-work, constant standing, or stools (for females only) without backs, and monotony. The contraction of *communicable diseases* was a bad risk in at least 2 places and fairly so in 4 others, due to the use of common drinking cups, improper wash-places and closets, spitting upon the floors, absence of cuspidors and lack of medical supervision. *Poisoning*, due to benzine and occasionally to benzol, was a bad hazard in 6 places and fairly so in the other 2. Benzine and benzine cement sat about in open cups into which brushes or sponges were dipped. Workers, as a rule, ate in the workrooms. It was claimed in most places that drafts could not be allowed, but in other places the windows were wide open. Industrial *alcoholism* and *coffeeism* were incited in proportion to the extent of poor drinking water facilities, the dust, fumes and fatigue.

In but 2 small places were all the workers of healthy *appearance*. In the larger places a few to a considerable number of pale looking workers were seen. The workers *complained* variously of the effects of the fumes, of the stuffy and close character of the workrooms and occasionally of the dust. Benzine stupor and fainting spells were common, especially among the females and those new at the work. It was said that many girls and sometimes men never came back after the first day or two. In 1 large place each girl averaged 1 day a week off on account of sickness. Sore throat, frequent headaches, dizziness and tiredness, and other symptoms of acute or chronic benzine poisoning were common complaints. Benzine dermatitis was occasionally encountered. A typical form of complaint was that in which the workers said that physicians appeared unable to better their ills. In 1 place a fainting girl was being rushed to the windows during the time of our inspection. *Comments.* Beyond question, benzol should not be permitted in the way in which it is used (fortunately rarely) in this process. All benzine and benzine cements should be kept in closed containers with some sort of automatic-valve emitter. The room temperature should be kept not over 68°. Some means of changing the air in the workrooms should be provided and everything done to keep down the concentration of benzine fumes. Finally, sickly and tuberculously inclined persons should be kept out of the process through medical supervision.

(Next month the subject of Rubber Manufacturing will be continued.)

OVERHEARD IN THE MEDICAL SECTION OF THE NATIONAL SAFETY CONGRESS AT PHILADELPHIA, OCTOBER 18-22, 1915.

E. R. HAYHURST, M. D., *Director, Division of Industrial Hygiene.*

Health supervision includes (1) sanitation features of washing facilities, toilets, etc.; (2) industrial hygiene, or the work health-relationships; (3) medical supervision, including preliminary examinations, periodic examinations, first-aid, and certain treatments; (4) general hygiene beyond the limits of the work-place; and (5) social insurance, including the whole scheme: accident, sickness, invalidism, old age, unemployment, maternity insurance, etc.

Practical experiences with the methods of health supervision emphasize (1) preliminary examinations in order to eliminate and select; (2) care of minor sickness; (3) first-aid; (4) supervision of plant hygiene and sanitation; (5) health publicity work; and (6) the following-up of all absences from work.

Some *results of medical supervision* show (1) individuals do not remain sick so long; (2) number of absences is reduced; (3) instead of hiring infectious foci there is a getting rid of those foci present; (4) particularly are syphilis, paresis, trachoma, and hernia eliminated or controlled; (5) blood-pressure determinations have proved very valuable in prognosis and elimination of unfit workers; (6) dental examinations have discovered much; (7) the

number of men hired has decreased much and along with this the cost of training new men; (8) protection against fake claims; (9) there is evidence that society itself is not assuming its share of the responsibilities; (10) while state controlled insurance is especially recommended.

The *standardization of medical systems* is in need of data in order to lay down directions for future progress by which to determine standards (1) for the individual and for equipment, including physicians, nurses, space, etc.; (2) for physical examinations; (3) for rejections; (4) for diseases and conditions which do not totally incapacitate; (5) for treatments; (6) for sanitation; (7) for records; and, finally, (8) for sickness insurance.

Standard forms for recording medical data should be two in number—one for the personal-health-data of the worker, and one for the employment-health-data of the work-place, irrespective of whether the data is secured by the factory physician, an inspection bureau (insurance or state), or by hospitals, private physicians, nurses, etc.—otherwise no need for standard methods. Forms for tabulating such data were distributed at the meeting. Emphasis was laid upon accepting the U. S. Census Bureau's "Index to Occupations, Alphabetical and Classified", as the standard for nomenclature and symbols. Efficiency the watch-word.

Some of the causes of *objections to health supervision* on the part of workers are: (1) failure to explain the idea of physical examinations; (2) the fear that such is a scheme to eliminate union labor; (3) the fear that it will throw workers out of employment before their time; (4) workers do not believe a doctor should decide how they should live—try it on yourself; (5) any change as a result of such examinations is apt to be a downward one; (6) the fear that a weakening man is too soon discovered and too soon let go; (7) the apparent uselessness of examinations in many working relations; no objections to examinations in special cases—caisson work, lead work, or in safeguarding the public; (8) the distrust of examinations made by company physicians: no objections to examinations conducted by the State; (9) no real provisions as yet for those found unfit; (10) practically all objections would disappear if some insurance and assurance scheme were to be adopted first.

During the discussions, speakers made the following points concerning medical supervision:

1. There are a large number of instances in which men have been put on their feet and, indeed, have much better jobs.

2. Where an intelligent nurse was sent through an establishment to pick out probable defectives by appearances alone, physicians afterwards found that 25 per cent. of her selections required medical or surgical attention.

3. It pays to spend money on every instance of sickness.

4. Medical supervision means a knowledge of the industry as well as that of physical examinations.

5. Industrial hygiene should begin with the child.

6. Find the cause of every man's symptoms. Look the plant over. Do not stop with the simple physical examination.

7. The industrial physician must be trained at the plant.

8. All places can be made safe for health as well as against accidents.

9. Divide expenses between employer and laborer. In one large corporation the worker's share amounts to 75 cents per month.

10. You must have the sympathy of the laborer. Point out to him that physical supervision is for both. You cannot make a satisfactory examination if the individual is unwilling.

11. Offer rest when necessary; one-half hour, one hour, one week, one month, send to country if indicated, send to sanatorium if indicated.
12. Always combine physical examinations with a relief scheme.
13. On new applicants physical examinations result usually in from 2-7 per cent. being rejected—usually contagious diseases, or bad hearts or serious physical defects.
14. Exceptional industries only may require a large rejection of new men.
15. Physical examinations should be used simply as methods of improving, not of selection.
16. "First-aid" is often the cause of serious results. Immediate first-aid which could possibly influence the result one way or the other has not been found of any real in a corporation employing 18,000 workers in the coal and iron industry.
17. Different sized plants require different standards. Standards should be adopted for the plant of 25 employes, for 100, for 1,000 and for 10,000.
18. Standards should come safety appliances, industrial hygiene, personal hygiene, physical examinations treatments and reliefs.

A PRELIMINARY REPORT ON THE BACTERIAL FLORA OF SODA FOUNTAIN GLASSES, ETC. *

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At the request of the Executive Officer of the State Board of Health a number of examinations were made to determine the importance of the common drinking cup as a conveyor of disease germs. At the time this investigation was undertaken nearly all of the common drinking cups had been removed and the most available source of information was taken to be the glasses used at the soda fountains for the dispensing of soft drinks. Cultures were taken from glasses and spoons used at nineteen fountains and one bar.

The glasses at most fountains are kept on a rack or drain board behind the counter; and are bottom up presumably to prevent germs and dust in the air from dropping in. The cleanliness of the drain boards corresponds to the general cleanliness of the fountain as a whole. In some fountains there is very little that one can criticize, while in others there is very little which one cannot find fault with. At the fountains where the management does not have a high regard for sanitation one sees the creamy and milky wash water deposited on the drain boards which hold the supposedly clean drinking glasses and ice cream dishes.

When a patron calls for a drink the glasses are sometimes rinsed and at other times the drink is served without further rinsing. The method of rinsing varies at the different fountains. At some places the glasses are scrubbed with soap and a soda solution and then rinsed under a spigot or in a tank. Some tanks have a continuous flow of fresh water while others are allowed to fill and have a change of water after the water has become visibly filthy due to the rinsing of a large number of glasses, ice cream dishes and spoons. Many of the attendants use their hands to remove materials adhering to the rim of the glass after which they rinse by the various methods mentioned above.

* Reprint, Florida Health Notes.

The method of cleaning the glasses at most of these fountains is considered unsatisfactory. Only a few of the fountains clean their glasses in running water. A great many have tanks in which the water is allowed to stand for varying lengths of time until one can see milky deposits and filth on the surface of the water in which the glasses are rinsed. It is quite evident in these places, that from a bacteriological standpoint the glasses will be more filthy after they are rinsed than before.

All cultures were taken by means of sterile swabs such as are sent out for swabbing throats for diagnosis of diphtheria. The cultures were taken by swabbing the rim of the glass all the way around and to a depth of about one-half inch from the upper edge of the glass both inside and out. These cultures were planted on blood serum media and incubated from eighteen to twenty-four hours and then examined according to the routine used in examining cultures from throat swabs.

The first sixty-eight cultures were stained with Loeffler's Methylene Blue and the diphtheroid organisms noted. Other organisms were also looked for and recorded. The last one hundred and eighty-seven samples were stained with Ponder's stain according to Kinyoun's modification. The following organisms were found: Diphtheroid bacilli, staphylococci, streptococci, micrococcus catarrhalis, slender bacilli, colon like bacilli, diplococci, sarcinoid cocci, spore bearing bacilli, bacilli in long chains, micrococcus tetragenes, long beaded bacilli and yeast cells. Some swabs showed squamous epithelium from the lips.

In a total of two hundred and fifty-five cultures these organisms occurred in the following ratio: diphtheroid bacilli 38 times; staphylococci, 109; streptococci, 24; micrococcus catarrhalis, 18; slender bacilli, 25; colon-like bacilli, 64; diplococci, 51; sarcinæ, 18; spore bearing bacilli, 4; bacilli in long chains, 5; micrococcus tetragenes, 6; long beaded bacilli, 12; and yeast cells, 16 times. There were a number of cultures where no record was made except as to the presence or absence of the diphtheroid bacilli and streptococci, so aside from the report on diphtheroid bacilli and streptococci the ratio is incomplete.

We find however, that of the first sixty-eight specimens taken diphtheroid bacilli appear fourteen times, or twenty per cent. At the time the first sixty-eight cultures were taken there were a number of cases of diphtheria in the city. At the time the next one hundred and fifty cultures were taken there were exceptionally few cases of diphtheria in the city and in the adjacent community. Out of these one hundred and fifty we found seven or 4.6 per cent to show diphtheroid organisms. When the last series of thirty-eight specimens were taken diphtheria was on the increase and cultures were coming in daily from suspected throat cases. In this series of thirty-eight we found diphtheroid organisms present in twelve or 31.5 per cent.

A number of spoons were swabbed at various fountains and gave fairly rich growth on Loeffler's blood serum media, many showing diphtheroid bacilli. There seems to be a very suggestive relationship between the presence of diphtheroid organisms on public drinking glasses and eating utensils and the number of cases of "sore throat" in a community.

This investigation shows the need of greater hygienic precautions at soda fountains where foods and soft drinks are dispensed in the uncooked state. The articles served are, with the exception of coca cola, good culture media favoring bacterial multiplication, and when such organisms as diphtheria, "typho-colon-bacilli," pneumococci, streptococci, staphylococci micrococcus

catarrhalis, and other pathogenic bacteria are deposited by a germ carrier or otherwise, they find a favorable medium on which they can exist and multiply without becoming appreciably attenuated.

It would be a simple and inexpensive procedure to institute methods of cleaning and sterilizing at these public fountains which would insure clean spoons, glasses and dishes. Where such precautions have been taken sterile swabs were obtained.

These investigations have been made at scattered intervals, and without opposition from the management of the soda fountains and ice cream parlors. In nearly all cases I was met with a manifestation of a desire to learn how the fountains might be operated on a sanitary basis. Many fountains adopted suggestions for cleaning and sterilizing glasses, which on subsequent tests indicated improvement. On the other hand there were a few who were inclined to ridicule the idea of the work, and without exception these places were conducted with the least sanitary precautions, and cultures from glasses at such fountains showed profuse bacterial growth both before and after rinsing.

CONCLUSIONS.

1. The soda fountain glasses can be a means of transmitting pathogenic bacteria from bacillus or germ carriers and from the sick and convalescent to the well.
2. These glasses are more important than the common drinking cup on account of the frequency of use of such glasses by different individuals and the nature of the material served, most of which is a good culture medium.
3. Practical rules should be adopted for the sanitation of ice cream parlors and soda fountains which would insure clean glasses, ice cream dishes and spoons. All glasses, dishes and spoons should be rinsed first in a solution of chlorinated lime, or other approved disinfectant and then cleaned and rinsed in running water. Where there are visible parts of fat, mucus, or dirt the glasses should be cleaned in a soda solution by means of a brush, and then treated with disinfectant solution and rinsed in running water.
4. All fountains or ice cream parlors failing to comply with such rules should be posted as unclean. This would not impose a hardship on the public because it would simply assure cleanliness in the indulgence in luxuries, such as ice cream parlors and soda fountains are.

NOVEMBER MEETING OF THE STATE BOARD OF HEALTH.

A special meeting of the State Board of Health was held at the Miami Hotel at 8 p. m., November 10th.

A hearing was given to a representative of the village of Wauseon with reference to a complaint that the village has caused the pollution of Turkey Foot Creek to such extent as to create a public nuisance. The investigation made by the Division of Sanitary Engineering of the State Board of Health shows that there is good cause for the complaint. A representative of the

village, while acknowledging the fact that the village is responsible for the pollution of Turkey Foot Creek, pleaded that the improvement of the water supply was of more immediate necessity than the elimination of the pollution of the stream, and asked that the village be permitted to improve its public water supply before proceeding with the elimination of the stream pollution nuisance. On consideration of the matter the Board decided that it would be inadvisable to issue an order at this time but to allow the village to proceed with the improvement of its water supply. At the same time, attention is called to the fact that the village should cause plans to be prepared for a comprehensive sewerage system with plans for proper disposal of the sewage.

The minutes of the special meeting held September 23, 1914, were presented and approved. The Secretary presented his monthly report, which was approved. Attention was called to the great increase in the work of the laboratory due to the transfer of analytical work from the Board of Agriculture to the State Department of Health. The Secretary called the attention of the Board to the fact that it will be necessary to secure additional assistance and recommended that an appeal be made to the Emergency Board for necessary funds.

Plans for a new distributing reservoir for the public water supply of Athens, Athens County, were approved.

The Board approved plans for a proposed temporary disinfection plant for the public water supply of the village of Barnesville, Belmont County. It is required that the village of Barnesville shall provide expert superintendence of the proposed disinfection plant for a period sufficient to determine the proper treatment of the supply, and that the operation of the plant shall at all times be satisfactory to the State Board of Health. The village was advised that the Board does not sanction the permanent use of a disinfection plant for the treatment of a public water supply, and in this case recommends the installation of a water purification plant of satisfactory design.

Plans for a proposed water supply for the Clark County Infirmary were approved. The supply is to be obtained from a well located near the infirmary building. The county commissioners are required to so arrange the distributing system that there shall be no chance of contamination of the well water by water from a tank in which soft water is stored.

Plans for a public water supply to be derived from wells were approved for the village of South Charleston, Clark County. The village council is required to pass an ordinance to prevent the existence of any source of contamination within 500 feet of the site of the wells. Attention is called to the fact that this water supply will be unsatisfactory on account of its hardness and the amount of iron it contained. The water is satisfactory from a sanitary standpoint.

Plans for sewerage and a sewage treatment plant for Ottawa Hills, Sub-District No. 1, Main Sewer District No. 5, Lucas County, were approved. The realty company owning the sub-division is required to provide for the proper installation of the sewers and sewage treatment plant and for the proper operation of the treatment plant. As soon as the proposed intercepting sewer is constructed in Ten Mile Creek this plant is to be abandoned and connection made direct to that sewer.

Plans for sewerage and sewage treatment for the Sylvanhurst Sub-Division and the Sylvanhurst Extension to the city of Lakewood, Cuyahoga

County, were approved. The approval carries with it the condition that the owners of the allotment and the city of Lakewood shall provide for the proper care and maintenance of the proposed sewage treatment plant. Plans for additional sewerage for the city of Wapakoneta, Auglaize County, were approved. It is required that the intercepting sewers shall be extended and a sewage treatment plant installed when required by the State Board of Health and that the city council shall pass and enforce an ordinance defining the proper use of combined, sanitary and storm water sewers and regulating connections thereto.

The Board received a report of an investigation of a complaint that the village of Hubbard, Trumbull County, is causing the pollution of Mud Run. The Board found as a result of the investigation that Mud Run is polluted by sewage from the village of Hubbard to such an extent as to give rise to foul and noxious odors and to conditions detrimental to the health and comfort of citizens of Hubbard Township, Trumbull County. It was voted to inform the village of the Board's findings and that a hearing would be granted at the next meeting.

At the request of the village council and village solicitor of Lebanon, Warren County, the Board voted to extend the time within which the village must install and place in use a sewage treatment plant to correct the pollution of Turtle Creek. This change in date becomes effective as soon as approved by the Governor and the Attorney-General.

The Division of Sanitary Engineering presented a report of an investigation of a complaint that the city of Marion is polluting the Little Scioto River. The investigation shows that there is good cause for the complaint. The Board voted to require the city of Marion to submit, prior to July 1, 1916, data and maps giving complete information relative to the location, source and grades of existing sanitary and storm water sewers and areas, population and sewage flow tributary thereto, such information to serve as evidence to be considered by the State Board of Health in connection with further action pursuant to a complaint by the trustees of Big Island Township, Marion County.

An investigation of the public water supply of the village of Struthers, Mahoning County, shows that this supply is impure and dangerous to health and that it is not practicable to sufficiently improve the character of the supply by removing the source of pollution affecting it. The Mahoning Valley Water Company, owners of the water franchise, have been notified to appear at the next meeting of the Board to show cause why a water purification plant to filter and purify the present water supply should not be installed and placed in operation.

A petition was presented, signed by some sixty-six electors of the village of Rocky River, complaining that the public water supply of that village is believed to be impure and dangerous to health and requesting the State Board of Health to immediately investigate the conditions complained of and to take such action as the law provides. This petition was referred to the Division of Sanitary Engineering for investigation and report.

Complaints were filed by the Townships of Blanchard, Ottawa and Perry, in Putnam County, against the Continental Sugar Company, The National Refining Company, The Independent Torpedo Company, The Buckeye Reduction Company, The Paragon Oil and Grease Company, the village of Ottawa and The Ottawa Sugar Company. All these are located in either Hancock or Ottawa

Counties. It is alleged that these plants and the village of Ottawa are responsible for the pollution of the Blanchard River, and the State Board of Health is asked to investigate the complaints and to take such action as is necessary to cause the nuisance to be abated. These complaints were referred to the Division of Sanitary Engineering for investigation and report.

Plans were approved for sewage disposal for the Woodville Normal School at Woodville, Sandusky County; for a school building at Gahanna, Franklin County; for the Scioto Country Club in Franklin County, and for a school building at North Kingsville, Ashtabula County.

The Board approved the appointment by the county commissioners of Tuscarawas County of Margaret E. Ruba as public health nurse for that county. The Board also approved the appointment of Mary Pearl Lloyd, as a public health nurse for Jefferson County.

Under the authority of Section 3393 of the General Code, Dr. J. F. Shrontz was appointed as health officer for Clay Township, in Knox County, the township board of health having failed and refused to make an appointment.

Health officers appointed by councils to serve in lieu of a board of health were approved for Carrollton, Dexter City, Florida and Piketon. The Board also confirmed the appointment of Dr. R. Y. Littleton as health officer for the village of Stout, Adams County.

Orders and regulations adopted by Dr. J. W. Lowe, Health Officer at Mentor, were approved.

The Board voted to issue licenses to the Maternity and Children's Hospital, 1609 Summit Street, Toledo; Door of Hope, Dayton; Mrs. Clara Simmons, 360 Belvidere Avenue, Columbus; Mrs. Reid Drew, 1369 Clifton Avenue, Columbus; Mrs. Elizabeth Donaldson, 1526 Thomas Avenue, Columbus. Licenses were refused to the Samaria Rescue Home, 1432 East Rich Street, Springfield, and to Mrs. Edith Earl, 256 Park Avenue, Columbus.

The Board adopted the following resolution in regard to the administration of the law passed by the last General Assembly providing for the prevention of blindness.

RESOLUTION IN RE PREVENTION OF BLINDNESS FROM INFLAMMATION OF THE EYES OF THE NEW BORN.

WHEREAS, The act for the prevention of blindness from inflammation of the eyes of the new born (G. C. 1248-1 et seq., 106 O. L., 321) makes it the duty of the State Board of Health "To report any and all violations of this act as may come to its attention, to the State Board of Medical Registration and Examination and also to the local police or county prosecutor in the county wherein said misdemeanor may have been committed, and to assist said official in every way possible, such as by securing necessary evidence."

Be it resolved, That the Secretary and Executive Officer be and is hereby authorized to act for the State Board of Health in making such reports as are above required and to give such assistance and secure and present such evidence as may be necessary to aid in securing the conviction of any person who violates any provision of the act above referred to, or any provision of the rules and regulations adopted by the State Board of Health under authority granted in said act.

The Secretary presented several communications from the board of health of the city of Akron relative to the use of leather dyes containing nitro benzol and methyl alcohol. After a consideration of the statements made by the Akron Department of Health and of analyses made of these leather dyes, the

Board decided to refer the matter to the Division of Industrial Hygiene for further investigation.

A representative of the chemical closet was present and presented to the Board what he deemed the merits of the type of closet manufactured by his company and asked for action by the Board which would permit the installation of this closet inside residences and other buildings within the state. The representative was informed that in the opinion of the Board this type of closet could not, under the provisions of the State Building Code or the regulations of the State Board of Health, be installed within a building and that it would be necessary to install the closet as provided for privy vaults.

Dr. R. H. Grube, of Xenia, was elected as President and Dr. Angus MacIvor, of Marysville, was elected as Vice President for a term of one year beginning December 10th.



EDITORIAL SECTION.

**The Circumstantial Character of Occupational Disease Evidence—
A Blow to Efficiency.**

As with all diseases when we discuss the cause, there is always the possibility of something else, or that some one cause has not been emphasized enough. It is not strange that this should be true of occupational diseases along with the others. Even in the case of specific occupational diseases, such as lead poisoning, the circumstantial evidence surrounding the incidence of such cases must be given very large consideration. If a man works where he is exposed to lead in a poisonous form, and he becomes anemic, perhaps loses some in weight, and is otherwise not quite himself, the very circumstance of his association with lead should be given very considerable appreciation as to the cause of his affliction. We have known physicians employed by industrial establishments to refuse to countenance such instances as probable lead poisoning simply because there were not more definite symptoms present, or the worker did not have a "lead line", or colic or any signs of paralysis.

This is simply the old idea of waiting until the drink habitue has delirium tremens before pronouncing his case one of alcoholism. The very fact that this prevalence of a little anemia, slight loss of weight and slightly-under-normal conditions is greater in the departments where lead is used or worked upon should be a highly significant factor in the diagnosis.

It seems impossible to impress the point upon some persons, including physicians in some instances, that diseases may be occupational or only *partly occupational*; that there are very few of the former and a very large number of the latter; and that the custom abroad and even in Ontario is to put the burden of proof that they are not occupational, or partly occupational, upon the employer who must show that the worker was not subjected to any hazards which could have caused his complaint. In Ohio, diseases both occupational and partly occupational should be reported to the State Board of Health, the more so since manufacturers are continually importuning us for information about diseases partly occupational and methods adopted anywhere to prevent the same. The factory physician who believes that he is protecting his employer by not reporting both classes of occupational diseases to the State Board of Health is not only transgressing the law, but the wishes of his employer in most instances, since the latter is interested in every feature which tends to promote efficiency in his plant, even to the securing of information from the State Departments or from any source where others may have the collecting of information from over a wide area. The fear that a State Department is going to use such information to "show up" an industrial establishment or employer to the public, or to compel an expenditure of money on installation of questionably efficient health appliances incommensurate with the exigencies of the case, and to forget the responsibility of the of the individual worker, should be abolished at once in this State. We all are desiring efficiency, and should all be most willing to co-operate.

Scientific Management Does Not Recognize the Necessity for Physiologic Variants.

In this day of time and motion study, with tiny electric lamps tied to the finger tips, with cyclechronographs and moving pictures turned upon the motion expert so that the film may be studied out afterwards in order to ascertain what movements may be cut short or eliminated entirely in work processes—the whole being one of the basic ideas of scientific management—it behooves physiologists and hygienists to look into this matter at the same time.

It has been amply demonstrated that where these systems have been installed and workers carefully instructed to follow the movements of the demonstrator who has figured out the most rapid and at the same time energy-conserving procedures, outputs have been doubled and, indeed, trebled, a chief stimulant being the offering of prizes and the removal of any limits upon piece-work. Indeed, oftentimes the noon hour is shortened, all other recesses are done away with, the day may be slightly lengthened, and responses to Nature's calls are encouraged to be kept in abeyance. In contrast to this, we must again emphasize the rapid increase among adults of chronic afflictions and "wear out" diseases. Insurance companies, vital statisticians and economists are all amazed indeed, at increment in premature senility.

It appears that one of the chief points which the scientific management expert has overlooked is the introduction of the use of more than one shortcut method of performing a series of movements. In other words, they fail to appreciate that the introduction of changes in self-same movements at the end of every 15 or 30 minutes or so, by the adoption of a slightly different set of movements (the greater the difference the better) would be a wonderful factor in conserving the energy of the individual worker while not materially detracting from his output. The physiologic variant, which so ably offsets fatigue, is the health factor concerned. Were this idea adopted as a distinct feature of scientific management, the claim by many that the inexhaustible supply of labor is the chief reason that scientific management succeeds might be more thoroughly refuted.

* * *

Personal Hygiene the Criterion Rather Than Physical Perfection.

A recent report of the Industrial Commission of Ohio states that about 15 per cent. of all industrial workers in the State are now physically examined. The proportion is going to increase rapidly within the very near future. Physical examinations result in classifying workers more or less in accordance with physical perfections or imperfections. Naturally, numbers of persons are found physically unfit to pursue the callings which they desire, while some are so unfit as to render them a great hazard wherever they may be employed. The hazard is usually one to the individual himself, but his physical unfitness may endanger others.

At the recent annual meeting of the American Public Health Association in Rochester and, also, at the National Safety Congress in Philadelphia, emphasis was laid by many speakers upon the existence of very few physically perfect individuals as the result of extensive physical examinations. Some have imperfections which may be corrected, while others, who are by

no means physically normal, have still an unimpaired productive efficiency which can be utilized without danger to themselves or fellow-workers or the public. An attempted selection of a proper kind of work for the individual, whether physically perfect or not, is the disposition in practically all establishments at present, and that is all.

It appears to us that a most important feature is being overlooked in selecting workers by means of physical examinations alone. At first thought a vital oversight is, of course, the failure to ascertain the mental or psychical equipment of the individual. This phase we will not discuss further at this place, except as it has a bearing upon the individual's interest in his own health and his correct knowledge of personal hygiene. Would it not be much safer to employ a physically imperfect individual who, in addition to a knowledge of his imperfections, *practiced intelligent personal hygiene* in the matter of habits, sleep, diet, rest, cleanliness, pursuits of happiness, etc., than to employ a physically perfect Apollo who, by his very failure to observe these, must soon dissipate his qualities and prowess and is always a menace both to himself and his fellows? Should not an endeavor to follow a clean and normal life be considered even more important than the mere finding of a physical examination in the selecting of workers? Along with every physical examination should go a questionnaire about personal hygiene.

* * *

Prevention of Rabies by Muzzling Dogs.

The inherent right of the dog to run at large in his care free way, unhampered by leash, muzzle or other means that would make it more difficult to transmit rabies, if infected, or to seriously injure children or adults, has been determined so far as New York City is concerned by a decision of the New York Supreme Court—New York County.

In the case of *People ex. rel. Knoblauch v. Warden of City Prison* (153 N. Y. Sup. 463) the relator was held by a city magistrate for the violation of the following section of the sanitary code:

"Section 80. No unmuzzled dog shall be permitted at any time to be on the public highway or in any public park or place in the city of New York."

The regulation was declared to be unconstitutional because the board of health had assumed to do something the board of aldermen were authorized to do; that the regulation was unwarranted and unnecessary, and that some less stringent restriction would have accomplished the same result. In disposing of these contentions the court says:

"A general power in the board of aldermen to regulate certain businesses and acts is in no wise in conflict with a power of the board of health to impose additional provisions for the specific purpose of protecting the public health.

The primary object of the ordinance is to secure protection against rabies. In spite of the discussions as to the prevalence or even existence of this disease, the prevailing opinion, both lay and medical, is that such a disease exists and is a menace to public health. The official records of the board of health show that in each of the last two years there have been 8 cases of human rabies, and that during the year 1907 there were 28 cases of human

rabies. The percentage of mortality in such cases is 100; that is to say, the disease, once established, is absolutely incurable. It is also shown that the disease is spread among animals by one rabid animal biting a sound animal, and is spread among human beings only by bites from rabid animals. The inference from these facts is clear. The protection from a disease which actually exists and kills a number of persons each year is a function of the board of health. The disease can be completely eradicated if it becomes impossible for a rabid animal to bite another animal or a human being, and the disease can be controlled in exact proportion that control and protection from such bites can be secured. Any rule made by the board of health which has a reasonable and direct relation to securing protection from bites of animals which may be rabid is therefore a proper exercise of its functions. The relator does not dispute that this is the law, but urges that the ordinance under consideration goes beyond the needs of the situation. It must be remembered, however, that the determination as to the means of meeting a threatening situation has been vested in the board of health, and not in the courts.

The disease of rabies must necessarily be exterminated if rabid animals can be prevented from biting sound animals. That result can be reached if the present ordinances are successfully enforced; i. e., if all stray animals are driven from the streets, and dogs allowed only under the double protection of muzzles and leashes. Under the circumstances it seems to me quite illogical to urge that the ordinance bears no reasonable and direct relation to its purpose. Consequently the court must hold that it comes fairly within the power of the board of health, even though the court might feel, which it by no means desires to intimate, that it might have found other means less annoying to dog owners which might prove equally effective."

The dogs of Ohio enjoy no more freedom of restriction under a guarantee of the constitution or law of the land than they do in New York City and in the presence of cases of rabies in animals just as rigid precautions for the protection of the public should be taken in the municipalities and townships of Ohio as were taken in the city of New York.

* * *

Contracts in Violation of Public Policy.

A court decision of especial interest to boards of health and health officials is published in *Public Health Reports* for October 1, 1915. This is the decision of the Supreme Court of Maine in the case of *Lesieur v. Inhabitants of Rumford* (93 Atl. Rep. 838).

The question at issue is the authority of a board of health to contract with one of its members to render medical service in a case of contagious disease with the expectation that compensation for the service will be paid by the municipality. The decision of the case is based on the ground of "public policy" as evidently there is no statutory law in Maine prohibiting such contracts. The matter is interesting to public officials in Ohio, not because of its direct application, as statutory law in this state would prohibit a contract of this kind, but because of the explanation that is given to the term "against public policy", a term that has little meaning to the average citizen.

Following are extracts from the opinion of the court:

It has been said that no exact definition of public policy has ever been given. The courts, however, have frequently approved Lord Brougham's definition of public policy as the principle which declares that no one can lawfully do that which has a tendency to be injurious to the public welfare. (*Egerton v. Earl Brownlow*, 4 H. L. Cas. 1, 235.) This principle has been termed the policy of the law, or public policy in relation to the administration of the law. Precisely what public policy is in any given case may be a difficult question to answer with precision. It has been well said, however, that, whenever the courts are called upon to scrutinize a contract which is clearly repugnant to sound morality and civic honesty, they need not look long for a well-fitting definition of public policy or hesitate in its practical application to the law of contracts. It may be said, as a general statement of some of the principles underlying the doctrine of public policy as applied to the law of contracts, that a contract is against public policy if it contravenes some public statute or tends clearly to injure the public health, or the public morals, or to work injustice and oppression, and thereby injure the public welfare, or to impair the public confidence in the purity of the administration of the law, "or to undermine that sense of security for individual rights, whether of personal liberty or of private property, which any citizen ought to feel."

It may be assumed that the contract in question is not expressly prohibited by statute. Nor does it stipulate for the doing of anything repugnant to morality; on the contrary, the service contracted for was necessary and lawful to be done. Nevertheless, where the contract is not prohibited by statute and stipulates for nothing that is *malum in se* or *malum prohibitum*, if it clearly appears to be in violation of some well-established rule of law, or that its tendency will be harmful to the interests of society, it is against the policy of the law to uphold and enforce it.

It is well established as a general rule that one acting in a fiduciary relation to others is required to exercise perfect fidelity to his trust, and the law, to prevent the neglect of such fidelity, and to guard against any temptation to serve his own interests to the prejudice of his principal's, disables him from making any contract with himself binding on his principal. The invalidity of a contract entered into in violation of this rule does not necessarily depend upon whether it affords him the opportunity, and subjects him to the temptation, to obtain such advantage. The test is not whether harm to the public welfare has in fact resulted from the contract, but whether its tendency is such that harm will result.

* * *

Mortality of the Industrial Population of Ohio.

The mortality experience of the Metropolitan Life Insurance Company is of interest because it is essentially the mortality experience of the industrial population of the State. Nearly one out of every ten persons in the State is insured in the Industrial Department of this Company. The returns are, therefore, representative and present an instructive collection of facts about the vitality of the working classes of Ohio.

In the two years 1913 and 1914 combined, the Company paid 13,566 claims on white lives and 1,934 claims on colored lives. These claims corresponded to a death rate of 10.9 per thousand, one year of age and over, for the white lives and a rate of 16.7 per thousand for the same ages for the colored. In the

general population of the State over one year of age, the death rate among white lives was 12.1 per thousand for the year 1913 (the last year for which figures are available) and among colored lives the rate was 22.4 per thousand. It is reasonable to conclude, therefore, that the vitality of those insured with the Metropolitan is somewhat greater than that of the general population. The decidedly superior vitality of the colored policyholders indicates that they are a highly selected group.

Of greater interest are the detailed returns of the Company for white lives insured in the four largest cities of the State, namely, Cleveland, Cincinnati, Columbus and Toledo; these are shown in the accompanying table.

The chief cause of death among the policyholders is tuberculosis of the lungs. In the four cities combined, 15.3% of all the deaths were from this cause; in the general population of the State over one year of age the corresponding figure was only 9.3% of the total deaths. This striking difference in the representation of tuberculosis may be directly charged to the greater life-strain upon the working classes of the community. The infectious diseases of children, including measles, scarlet fever, whooping cough and diphtheria, also show in each of the cities a higher proportionate representation than in the population at large.

Typhoid fever mortality is low in Ohio as is indicated in the statistics of the Company and of the general population. This is the result of the large amount of attention that has recently been paid to the water supplies in Ohio. The typhoid fever rate in Cincinnati is especially favorable, only seven deaths having occurred among the insured and twenty-four in the general population in the year 1913. In both Cleveland and Columbus the figures are somewhat higher but compare favorably with other cities of their size throughout the country. In Toledo, on the other hand, both the Company and population figures show a rather unhealthy typhoid situation which it is hoped will soon receive the attention of the sanitary authorities of the State and of the community.

The Metropolitan figures for the organic diseases of the heart and for Bright's disease parallel very closely those for the population at large in each of the four cities. The violent deaths are, however, much more represented in the Company results than in the population. This is true everywhere and is readily understood when we remember that the working population is constantly exposed to industrial accidents and to various other hazards which often result in violent death.

The foregoing experience of the Metropolitan Life Insurance Company in the State of Ohio is a matter of great interest to the Executives of the Company and they have in recent years inaugurated a campaign of education against the preventable diseases and have instituted a system of visiting nursing of sick policyholders. It has been demonstrated that this applied preventive work, in conjunction with the great efforts of the general community, have resulted in lowering the death rate in the Industrial Department both for white and colored lives. In the experience of the Company as a whole, the mortality has dropped 7.8% among white lives and 3.8% among colored lives in the last three years. Such results as this give great encouragement to the further extension and development of life conservation work on the part of insurance companies.—*L. I. Dublin.*

METROPOLITAN LIFE INSURANCE COMPANY—INDUSTRIAL
DEPARTMENT.

MORTALITY EXPERIENCE IN OHIO, 1913.

WHITE LIVES.

Comparison with Data for General Population.

Cities; Causes of Death.	M. L. I. Co., Experi- ence. White Lives.		General Population— over one year of age.	
	Number of Deaths.	Per cent of Total.	Number of Deaths.	Per cent of Total.
<i>Cincinnati</i>				
Death Rate per 1,000, all causes:				
M. L. I. Co., Exp., 13.3.				
*Population, 14.4.				
All causes	1,615	100.0	5,320	100.0
Typhoid fever	7	.4	24	.5
Measles, scarlet fever.....	38	2.4	78	1.5
whooping cough	6	.4	23	.4
diphtheria and croup....	27	1.7	50	.9
Tuberculosis of the lungs..	296	18.3	733	13.8
Cancer—all forms	98	6.1	379	7.1
Organic diseases of the heart	218	13.5	743	14.0
Pneumonia—all forms	132	8.2	429	8.1
Nephritis, and Bright's dis- ease	162	10.0	591	11.1
Violent deaths	123	7.6	227	4.3
<i>Cleveland</i>				
Death Rate per 1,000, all causes:				
M. L. I. Co., Exp., 11.7.				
*Population, 11.3.				
All causes	820	100.0	6,873	100.0
Typhoid fever	12	1.5	88	1.3
Measles, scarlet fever.....	32	3.9	200	2.9
whooping cough	6	.7	35	.5
diphtheria and croup....	36	4.4	211	3.1
Tuberculosis of the lungs..	88	10.7	702	10.2
Cancer—all forms	43	5.2	501	7.3
Organic diseases of the heart	98	12.0	733	10.7
Pneumonia—all forms	61	7.4	612	8.9
Nephritis, and Bright's dis- ease	64	7.8	596	8.7
Violent deaths	76	9.2	726	10.6

* Population over one year of age.

Cities; Causes of Death.	M. L. I. Co., Experi- ence. White Lives.		General Population— over one year of age.	
	Number of Deaths.	Per cent of Total.	Number of Deaths.	Per cent of Total.
Columbus				
Death Rate per 1,000, all causes:				
M. L. I. Co., Exp., 11.5.				
*Population, 13.2.				
All causes	298	100.0	2,413	100.0
Typhoid fever	7	2.3	35	1.5
Measles, scarlet fever.....	3	1.0	16	.7
whooping cough	1	.3	9	.4
diphtheria and croup.....	3	1.0	18	.7
Tuberculosis of the lungs..	44	14.8	230	9.5
Cancer—all forms	20	6.7	175	7.3
Organic diseases of the heart	32	10.7	256	10.6
Pneumonia—all forms	13	4.4	80	3.3
Nephritis, and Bright's dis- ease	19	6.4	176	7.3
Violent deaths	45	15.1	302	12.5
Toledo				
Death Rate per 1,000, all causes:				
M. L. I. Co., Exp., 9.8.				
*Population, 13.8.				
All causes	276	100.0	2,440	100.0
Typhoid fever	13	4.7	75	3.1
Measles, scarlet fever.....	8	2.9	24	1.0
whooping cough	1	.3	3	.1
diphtheria and croup.....	6	2.2	40	1.6
Tuberculosis of the lungs..	32	11.6	280	11.5
Cancer—all forms	13	4.7	138	5.7
Organic diseases of the heart	34	12.3	275	11.3
Pneumonia—all forms	14	5.1	124	5.1
Nephritis, and Bright's dis- ease	17	6.2	157	6.4
Violent deaths	35	12.7	275	11.3

* Population over one year of age.

* * *

The Work of Leonard McKee.

Some months ago, there was admitted to the Franklin County Tuberculosis Sanatorium a youth of 26 years, in the last stages of consumption. A weary sojourner had returned home to spend his numbered days near his family and friends. Pilgrimages to the West, the South and the Southwest which failed to repair the wasted body, had, however, served to increase and

develop the courageous, cheerful spirit, and the active mind of Leonard McKee. The will to be cheerful and the determination to fight his enemy to the end displayed by the newcomer soon inspired the other patients to greater efforts to regain their health and aroused in them a spirit of friendliness for each other and co-operation with the administration, to which the Superintendent, Mrs. Lawin, bears enthusiastic testimony.

This influence was later manifested in more concrete form and in the tangible shape of "The Lunger", an eight-page paper edited by McKee and issued from the Sanatorium. While the little publication, printed on a mimeograph and circulated with the aid of other patients, brought a new interest into the lives of the sanatorium's population, its more important work was done outside, for its fame soon spread, and through the generosity of the county commissioners, it was made available for sufferers throughout the county. People throughout central Ohio have learned through the agency of "The Lunger" that instead of being a cheaply administered makeshift appendage of the County Infirmary, as many thought, the Franklin County Tuberculosis Sanatorium is a large, well-equipped, modern institution, expertly administered, where scientific treatment and the best of care, at reasonable cost, or no cost at all to those unable to pay, are obtainable close to home.

One former Franklin County resident, reading "The Lunger" in a western sanatorium, was so impressed with the advantages offered at home that he returned to find the treatment better than any he had met in many expensive private hospitals. Doctors who hesitated to send patients to the institution have had it brought to their attention through "The Lunger", and after investigating its work, are urging the sick to take advantage of the opportunities for treatment which it offers. Lay persons, well and sick, know more than they did about the services which such a retreat can perform for a community.

Leonard McKee died December 1. The fighting spirit which had aroused the admiration of all who knew him, and the cheerful philosophy which shone through the sparkling paragraphs of the "The Lunger" and won the praise of professional writers and humorists, persisted to the last. His fellow-sufferers in the Sanatorium have borne witness to the work Leonard McKee did within the institution. Tuberculosis workers on the outside also testify to the important, if brief, part which he played, through the medium of "The Lunger," in the fight against the white plague in central Ohio.



PUBLIC HEALTH ACTIVITIES IN OHIO.

Ohio State Public Health Exhibit.

The Ohio State Public Health Exhibit has visited the following cities: Byesville, October 19-22; Cambridge, October 26-29; Dayton, State Conference of Charities and Correction, November 3-5; New Philadelphia, November 9-12; Kent, November 16-19, and Ravenna, November 23-26.

Conferences with local health officials were held in Cambridge for Guernsey County, New Philadelphia for Tuscarawas County, and Ravenna for Portage County. The policy of holding such conferences at county seats will be continued throughout the winter. These conferences are for health officers, members of boards of health and others having official connection with local public health administration.

Public Health Nurses.

On October 8, Miss Jessie Franklin was employed as permanent public health nurse by the Health Committee of the Federated Women's Clubs of Fremont.

Miss Nellie Blinn resigned on October 30 as public health nurse at Jackson. Her successor has not been appointed as yet.

Miss Nora D. Abbe, who has been serving as substitute nurse at Cambridge for the past few months, resigned on November 1, and was succeeded by Mrs. Florence Lee on November 8.

At the November meeting of the State Board of Health, approval was given for the appointment of Miss Mary Pearl Lloyd as instructive and visiting nurse for Jefferson County, and Miss Margaret E. Ruba as instructive and visiting nurse for Tuscarawas County. These nurses are employed by the Board of County Commissioners under Section 3151-1 to 3153-3 of the General Code of Ohio.

At the annual conference of the Ohio State Graduate Nurses' Association, held in Columbus October 19-20, the Section on Public Health Nursing elected the following officers: President, Miss Florence Walker, Cleveland; Vice President, Miss Helena R. Stewart, Columbus; Secretary-Treasurer, Miss Ellen Gadd, Springfield.

Circulating Library.

On September 1, the State Supervising Nurse began a circulating library for the use of the 430 public health nurses now employed in the State. The volumes in the library consist of:

La Motte	The Tuberculosis Nurse.
Davis	The Field of Social Service.
Newmayer	Medical and Sanitary Inspection of Schools.
Devine	Misery and Its Causes.
Cannon	Social Work in Hospitals.
Ayres	Laggards in Our Schools.
Gulick	Medical Inspection of Schools.
Rambousek	Industrial Poisoning.
Otis	Consumption.
Oliver	Diseases of Occupation.

These books will be sent to all public health nurses in the State in order of application and each book can be kept for a period of one month. Thus far the volumes in the library have been exhausted each month, indicating the usefulness of this service.

Expensive Economy.

The city of Lorain, O., has had five cases of infantile paralysis within a month.

Three months ago the state examiner of municipal accounts ruled that the city had no authority to employ a visiting nurse, and the woman who had held that post for a year was forced to resign.

Lorain health authorities say if she had been retained infantile paralysis could not have gained the headway it has gained.

Undoubtedly it is not entirely true. Undoubtedly it is not entirely false. In all likelihood, if the visiting nurse had remained on the job some of the cases would have broken out and some could have been suppressed through her counsel and the safeguards she would have erected against the spread of the contagion.

Let us say that Lorain has saved the salary of the visiting nurse for three months, or perhaps \$250, and has lost one child, so helplessly crippled as to be unable to fend for itself in the world, and to be always a charge upon the community. In saving \$250 Lorain has incurred, on such a supposition, a debt of perhaps \$400 a year as long as this cripple shall live—a debt that may well run up to \$10,000, or even twice that sum.

An economy which fails to provide for the health of a city is a pretty expensive economy for that city. If Lorain has no authority to employ a visiting nurse the State, if it is wise, will give cities that authority pretty quickly.
—*Canton News*.

Public Health Nurse.

Miss Elizabeth Davison, the traveling public health nurse, who has been in Logan the past month, left to take up the work at Wapakoneta, in Auglaize County.

Miss Davison was here to secure a permanent trained nurse for Hocking County. Her chief purpose was to get the people interested in the need of the work for the county and thus "line up Hocking County as one of the progressive counties of the state." While here she presented the project to our commissioners—also met and talked with many of the leading citizens of the county, securing their names to petitions, and made a number of addresses before the different clubs and organizations.

The large list of names of representative citizens of the town and county that was handed to the commissioners at the meeting, October 8, indicated that people are interested in securing a nurse, and will be keenly disappointed if the commissioners do not see their way clear to appropriate the necessary sum to support a nurse for the county.—*Logan News*.

Tuberculosis Hospitals.

Reports of admissions and discharges of patients are being received by the State Department of Health from all tuberculosis hospitals in the state with the exception of those maintained by municipalities, i. e., Cleveland and Cincinnati.

The reporting system went into effect October 1, and from month to month there will appear in the Ohio Public Health Journal a tabulation of these reports as received from each hospital.

The results from October 1 to October 30 inclusive, show a total of 195 notifications; of which 114 were admissions and 81 discharges. Of these 195 notifications, 146 were referred to local public health nurses for investigation and report; 7 were investigated by staff nurses of the State Department of Health; 4 were referred to health officers of other states, and 38 were pending investigation on October 30.

An interesting development of the system thus far is the fact that between 25 to 50 per cent. of hospital admissions and discharges are of cases previously unknown to local public health agencies. If the reports do nothing else for the tuberculosis campaign in Ohio except to enable the local agencies to get in more complete touch with their own situation, they will justify themselves. We believe, however, that they will prove equally valuable in a number of other directions.

A tabulation of the 195 notifications by hospital shows the following results:

OCTOBER 1-30 INCLUSIVE.

	<i>Admissions.</i>	<i>Discharges.</i>	<i>Total.</i>
Ohio State Sanatorium.....	38	26	64
District Tuberculosis Hospital, Dayton....	6	4	10
District Tuberculosis Hospital, Springfield	7	5	12
District Tuberculosis Hospital, Lima.....	0	5	5
District Tuberculosis Hospital, Springfield Lake	7	2	9
County Tuberculosis Hospital, Franklin...	19	17	36
County Tuberculosis Hospital, Lucas.....	30	13	43
County Tuberculosis Hospital, Butler.....	1	1	2
Rocky Glen Sanatorium, Morgan.....	6	8	14
Total	114	84	195

Butler County Tuberculosis Hospital.

The new Butler County Tuberculosis Hospital was examined by the county commissioners on their monthly inspection tour of the county infirmary. It was decided to paint both wings of the hospital white with drab trimmings. The basement of the new addition will be fireproofed according to instructions from the state. The commissioners contemplated the suggested plans for building a dining room in the rear of the hospital and accessible from both wings. Other improvements by Superintendent Theiss were approved.

Architect George Barkman, who is superintending the construction of the hospital, and Dr. Wm. Reed, who is the medical superintendent of the institution, were with the commissioners to offer information on the suggested improvements.

City Gets Tent Colony.

The tuberculosis tent colony for children, 11005 Buckeye Road, S. E., maintained by the Cleveland Anti-Tuberculosis League, has been moved to the Warrensville farms and transferred to city control and support.

New Shacks at Lima Tuberculosis Hospital.

Two of the ten new shacks being built at Lima District Tuberculosis Hospital have been completed and are ready for occupancy. W. P. Cahill, contractor, expects to have the other eight houses finished by November 1. The shacks are 25 by 12 feet in size, of frame construction. Each shack consists of two rooms, a living room 16 by 12 and a sleeping porch 9 by 12 feet. Thirty-three patients are now housed at the hospital.

May Double Capacity of Camp for Children.

Impressed by the success of the Kroger Hills Camp, conducted by the Cincinnati Anti-Tuberculosis League for anemic children, B. H. Kroger has offered to make an effort to raise funds to double the capacity of the camp next summer. Architect Rudolph Tietig has offered to make sketches for an additional building. The report of the league shows that 109 children enjoyed the advantages of the camp, and that they made an average gain of 4.44 pounds each in weight. One girl gained 25 pounds.

Children Having Tuberculosis Are Unprovided for.

The State of Ohio should make some provision for children in the treatment of tuberculosis, says Dr. S. A. Douglass, superintendent of the state sanatorium at Mt. Vernon, in a special report filed with the board of administration recently. Dr. Douglass declares that there has been a steady demand for the admission of children to the Mt. Vernon institution, and while a few have been accepted, their treatment has not proved as successful as it should under proper conditions.

"There is a tendency to spoil the children and harass the adults," says Dr. Douglass, "but a refusal to admit them and give them treatment means a denial of the opportunity for recovery." The state is urged to do something to save the lives of these unfortunate children and to keep them separate and apart from the adults at Mt. Vernon. Dr. Douglass says that no children under 15 years of age should be admitted to the Mt. Vernon sanatorium, and urges the state to take the proper step for their betterment and treatment.

He calls attention to the fact that Ohio has only one hospital where proper treatment may be given tuberculosis patients, while Pennsylvania has 118 free dispensaries. Ohio is losing 7,000 residents annually through the dreaded disease, and this could be greatly reduced if more free dispensaries were established. In making this statement, Dr. Douglass says that he is not unmindful of the great amount of good being done by private individuals and charitable societies throughout the state.

Of the patients given treatment at Mt. Vernon during the past year, 40 per cent. recovered to a condition which permitted them to return to work, while 20 per cent. were improved but not to a working capacity, and 40 per cent. were "lost," either through death or a condition which will prevent them from resuming their usual vocation. This is about up to the average of other hospitals where patients of this sort are treated.

The average daily attendance at Mt. Vernon for the year ending July 30 was 155, which is slightly over the capacity of the place. There is a constant waiting list, and hundreds who seek admission are denied it because of the limited facilities. That Ohio is not keeping up with other states in the treatment of tuberculosis patients is indicated by figures which shows the aggressive campaign which is being waged outside of Ohio, and the large number of hospitals where treatment may be secured. "There is plenty of work for all charitable agencies," Dr. Douglass says, in referring to the work being done at present in Ohio.

During the year a fine herd of milk cows has been purchased for the sanatorium, and more than 100,000 pounds of milk were produced during the year. This is the only sanatorium in the United States where a herd of fine cows is kept which furnishes sufficient milk for the patients. Since milk is one of the main foods for the invalids, considerable saving has come through this new agency.

Sixth Conference of Ohio Tuberculosis Hospital Superintendents.

The sixth conference of Ohio Tuberculosis Hospital Superintendents was held at the District Tuberculosis Hospital, Springfield, Ohio, November 19, 1915. Representatives were present from all hospitals with the exception of the Ohio State Sanatorium and Springfield Lake.

Chairman Bachmeyer presented a tentative set of rules and regulations for the internal management of the tuberculosis hospitals in the state. After careful consideration, the secretary was instructed to send a corrected copy to each member of the conference for further criticism. The rules and regulations will then be presented to the Ohio State Board of Health for approval and will then be used as a standard in all tuberculosis institutions in the state.

The conference voted to accept the invitation of the Ohio Hospital Association to join with it to form a section on tuberculosis hospitals.

Prevention of Blindness.

The development of the work for the prevention of blindness from inflammation of the eyes of the new-born has proceeded to date along the following lines:

1. Compilation of a mailing list exceeding 14,000 including:

- 8,000 physicians.

- 3,000 nurses.

- 2,150 health officers.

- 525 midwives.

- 325 hospitals, maternity boarding homes, dispensaries, etc.

- 70 members and Advisory Council of Ohio Commission for the Blind.

2. Revision of list of distributing stations of the Division of Laboratories for increased service in distribution of prophylactic.

3. Sending out of form letters to midwives residing outside of the five largest cities of the state, relative to supplying direct with the prophylactic.

4. Forwarding of literature and report blanks as follows:

To physicians, nurses, midwives, hospitals, maternity boarding homes and dispensaries: a book of ten report blanks, a copy of the law for the prevention of blindness, and the rules and regulations adopted by the State Board of Health under the law, the revised list of distributing stations of the Division of Laboratories, and the pamphlet, "Sore Eyes May Cause Total Blindness."

To health officers, and members and advisory council of Commission for the Blind: In addition to the above enclosures, a form letter outlining the work and duties under the law, blanks to be filled in by health officers, giving results of investigations and the history of each reported case, and a supply of addressed envelopes for use by health officers in forwarding case reports and investigation blanks.

To public health nurses: All the above literature, together with a special letter of information and instructions from the state supervising nurse.

The Organization of the Work. The receipt of a case report of inflammation will call forth the following investigations and duties from the State Department of Health:

1. Dependent upon health officer handling the case report—immediate inquiries by telephone or mail provided health officer fails to give required information.

2. Supplying to every mother of infant reported to have a case of inflammation of the eyes, direct by mail, copies of "Sore Eyes May Cause Total Blindness," and "How to Save the Babies."

3. Supplying nurses' services and other treatment, where required.

4. Securing reports of adequate investigations by health officer and history of cases.

5. Tabulation of information from case histories.

6. Maintenance of permanent lists of all infants affected, and names of mothers, for future reference, birth registration and child hygiene purposes.

7. Certifying to secretary and executive officer a list of all physicians, nurses, midwives, maternity homes and hospitals entitled to fees.

8. Securing and giving evidence for prosecutions.

Inflammation of the Eyes, Ophthalmia Neonatorum and Trachoma.

Since August 30, the State Department of Health has handled the follow-up investigations, by personal, telephonic or postal inquiry, of twenty-one cases of inflammation, thirty-two ophthalmia neonatorum and 69 cases of trachoma.

The 21 cases reported of inflammation have been received from 10 counties.

The 32 cases of ophthalmia from 16 counties and 69 cases of trachoma from 19 counties.

Maternity Boarding Houses and Lying-in Hospitals.

Inspections were made during the month in Dayton of the Door of Hope, Mrs. Mary Chitwood and J. A. Cullen; in Springfield, The Samaria Rescue Home; in Columbus, Mrs. Johnson, Mrs. Margaret Feters, Mrs. Zella Briggaman, Mrs. Reid Drew, Mrs. Elizabeth Donaldson, Mrs. Edith Earl, Mrs. Mary Kidds, and Mrs. Myrtle Siemers; in Toledo, Maternity and Children's Hospital, and Mrs. Lydia Bowers.

These inspections were made jointly with representatives of the Board of State Charities.

There are 33 institutions holding the State Board of Health license with 14 applications for license pending. Five of these 14 have been submitted to and approved by local boards of health. Four of these are approved and recommended for license and one not approved. One was submitted to a local board of health, which refused its approval.

Newspaperman Chosen.

George V. Sheridan, former Columbus newspaper man, was elected executive secretary of the Ohio State Medical Association at a meeting of the council of the state society. Sheridan is a layman, and his selection is a precedent, no other than a medical man having held the position in the 69 years that the association has been in existence.

The Health Campaign in Ohio.

In 1914 there were in Ohio 615 fewer deaths from tuberculosis than in 1910, though the population had increased nearly 250,000. In the four years there had been an increase of 43 public health organizations, of five tuberculosis hospitals, of 84 anti-tuberculosis nurses and of 13 free tuberculosis clinics. Cause and effect are here pretty well shown. The campaign against the disease is meeting with success, but the enemy is strongly entrenched and the victory is slow. In 1914 there were in Ohio 6,564 deaths from tuberculosis. There is still much to be done. The encouragement lies in the fact that the disease is conquerable and the forces of education and prevention are yearly growing stronger. — *Columbus Dispatch*.

Tuberculosis Society Plans for the Winter.

There are 1,200 cases of tuberculosis in Dayton according to the estimate made by Health Commissioner Light, notwithstanding the fact that less than 200 cases are under surveillance. This was brought out at a meeting of the Tuberculosis Society. The commissioner scored physicians for failing to report cases as required by law.

Tuberculosis week, December 6 to 12, as planned by the National Association for the Study and Prevention of Tuberculosis, was endorsed. On Wednesday, December 8, all persons, young and old, are asked to submit to a medical examination to determine their physical condition. Members of the Montgomery and Dayton Medical Societies, the Homeopathic Society and the

Academy of Medicine will be asked to offer their services free to persons who are unable to pay for the examination.

Liberal observance of health precautions in the public, parochial and private schools will be urged on Friday, December 10, and it is requested that exercises be conducted and that talks be given on sanitation and health. On Sunday, December 12, ministers are asked to devote all or portions of their sermons to the subject of tuberculosis. The federated churches have agreed to such observance.

The society will continue to co-operate with the Federation of Charities and Philanthropy. Several thousand dollars will be received by the tuberculosis society from the former organization that work may be carried on.

It is expected that fully 125,000 tuberculosis seals will be sold in Dayton this year, Mrs. W. C. Marshall having been made chairman of the committee in charge of the work.

Rigid enforcement of the ordinance against the sweeping of sidewalks during market hours will be insisted upon, the directors voting to request such action of the city welfare department. All members of the Board were made delegates to the State Conference for Charities and Corrections, held in Dayton.

Ohio Birth Statistics.

Seventeen children of each 1,000 born in Ohio last year were illegitimate, according to a detailed report made public Saturday by Dr. Morton W. Bland, state registrar of vital statistics, an Associated Press dispatch from Columbus says. The total number of births was 101,801, and 1,748 of these were illegitimate, making a rate of 1.71 per cent. of all children born. The total in Stark County was 35, a rate of 1.37.

Illegitimate children were born to 23 mothers under 15 years of age, one over 45, 58 at the age of 15, 111 at 16, 238 at 18, 188 at 19, 180 at 20, 147 at 21, and 113 at 22.

Geauga was the only county which reported no illegitimate births. Ross had 30 and the highest rate, 3.76 per cent. of the children born in that county.

Counties with low rates of illegitimacy were: Belmont, .17; Brown, .18; Coshocton, .02; Seneca, .48. Other counties, with their number of illegitimate births and rate were: Allen, 12, 1.19; Columbiana, 26, 1.61; Cuyahoga, 346, 2.02; Mahoning, 34, 1.10; Summit, 19, 1.48.

Illiteracy table showed that in counties where there is a large proportion of persons who cannot read or write the percentage of illegitimacy is correspondingly high, and the contrary.

Niles Physician Gets Heavy Fine.

Failure to report a case of diphtheria until after the case had expired was the cause of a prominent Niles physician's appearance before Mayor Bryan yesterday, and the paying of a fine of \$25 and costs by that gentleman. The charge was preferred against the physician by the health officer, who maintains the case was pronounced diphtheria twenty-four hours before it was officially reported to the health officials.

It is alleged the quarantine was not posted until after the patient's death and that the neighborhood was exposed to the contagious disease. The law specifically reads that physicians as well as individuals are liable to a heavy fine for not reporting contagious disease to the city health board. Other physicians who have been neglectful in this respect will be dealt with according to law in the future.

Dozen Don'ts — Issued for Instruction of Teachers.

One dozen "don'ts" for the care of eyes, ears, noses and throats are contained in a paper on these subjects written by Dr. W. K. Rogers, of Columbus, for the course of instruction of school teachers over the state, being arranged by Frank W. Miller, State Superintendent of Instruction. Other papers will be made public later.

Normal eyes, ears, noses and throats, in normal bodies, require very little hygienic direction beyond a few obvious "don'ts" according to Dr. Rogers. He suggests these:

Don't subject the eyes to prolonged reading or close application against a direct brilliant light; it exhausts the retina and ciliary body, rendering them sensitive later to ordinary use.

Don't try to read in a dim light; it results in fatigue and later irritability.

Don't try to rest yourself by reading when you are tired; your eyes are just as tired as you are.

Don't rely entirely on moral persuasion to correct a child's tendency to rub his nose against the book he is reading; first find out why he does it.

Don't subject the eyes to contact with dust; it carries infectious germs and is mechanically irritating.

Don't try to remove foreign substances from your eyes with unwashed fingers or used handkerchiefs.

Don't rub your lids with your hands because they smart.

Don't wash your face in the same bowl or use the same towel that has been used by some one else, just to prove your democratic spirit; neither dip your eyes in cold water and open them in order to "harden" them, for it won't; ordinary water is irritating to the eyes. If need something as a cleansing lotion use distilled water, adding a pinch of salt to a cupful of water.

Don't remove the wax from your ears with such domestic weapons as hair-pins, penholder, etc. You generally pack more wax into the ear than you get out. Nature tends to this toilet matter as a rule better than you do.

Don't subject the ear to sudden loud noises a close range; it may cause permanent impairment of hearing by minute hemorrhages in the labyrinth.

Don't make a practice of "sniffing" salt water or any other kind of water into the nose from the hand or a douche; sooner or later some of it will get into the ears through the eustachian tubes and cause trouble. If you have been breathing in infected atmosphere, a toilet spray is far safer than a douche.

Don't insist on sleeping out of doors in the winter and summer and in taking cold baths, just because you think it is a sturdy thing to do. Find out if it agrees with you personally, regardless of your neighbor's habits or advice, and by all means keep it up as long as it does. It does not follow, however, that it will do so in illness as well as in health. If you sleep out of doors, don't go bareheaded when you are asleep.

New Organization.

A state-wide medical organization to educate the people on the evil effects which science claims result from alcohol and narcotics was formed.

It will be known as "The Ohio Society for the Study of the Effect of Alcohol and Other Narcotics." The officers selected are Dr. S. P. Kramer, chief surgeon of the Cincinnati General Hospital, president; Dr. Benjamin R. McClellan, Xenia, vice-president; Dr. Charles B. Mills, of Marysville, Dr. J. S. Raiden, of Portsmouth, and Dr. R. G. Bishop, Jr., of Cleveland, executive committee. A secretary-treasurer will be elected by the president.

Cleveland Starts Health Movement.

"Health Day" in Cleveland, celebrated here for the first time by any municipality, was so successful that it promises to become a state day by act of the legislature.

The City Council Disease Prevention Day Committee will co-operate with the State Board of Health in getting an Ohio Health Day.

Bringing the importance of disease prevention to the attention of the people of the municipality, it has been shown, will accomplish more in one day every year than the preachments of thousands of individuals.

Adoption of an annual health day by other cities and states, and possibly by the nation, is expected to be the outgrowth of Cleveland's innovation.

Cleveland's health day is being followed up with a publicity campaign. Thousands of health rules have been distributed in pamphlet form. These rules were written by Dr. Ford of the health department. Moving picture theaters, newspapers and other publicity agencies are co-operating in the work.

Any individual who wants to know what to do to regain or conserve health has only to let the proper authorities know the desire and individual advice free is given that person at once.

Next year's health day will be celebrated not only through publicity and speeches, but with brass bands and a big parade.

Can't Land a Job Without Good Health.

One hundred and eighteen workers in six large Ohio manufactories last year were fired from work because of poor health.

One thousand and forty failed to land jobs in 26 establishments because they couldn't measure up, physically, to par.

"Never in the history of Ohio has good health been so necessary to the worker as it is today," says Fred C. Croxton, statistician for the State Industrial Commission, who made public a report showing that large Ohio factories and workshops are rapidly installing systems whereby employes and job applicants must undergo health tests if they are to get jobs and hold them.

At least 42 large Ohio concerns, employing approximately 68,500 workers, now require physical examination of either job applicants, employes, or both, Croxton's figures show.

Croxton urges supervision of health tests conducted by employers in order to protect workmen against discrimination.

Croxton's report shows that 29 establishments requiring physical tests in 1914 examined 30,718 applicants during the year, and that 12 establishments requiring health tests of their employes in 1914 examined 22,279 employes.

Croxton's report excludes railroads, street car and other public utilities which for many years have required health tests.

Steel works, rolling mills, foundries and machine shops are the types of establishments most rigorous in their insistence on healthy workers, the report shows. Rubber manufacturing plants come next.

There were two large telephone concerns in the state which last year examined physically all girl operators hired.

Croxton, in his report, mentions as significant the fact that, although six large employers who tested the health of their employes, found 791 physically unfit, they only discharged 118 following the examinations.

"The remaining 673 were allowed to remain at work and were given advice concerning treatment," his report states.

Here's a list of ailments which were responsible in most cases for the discharge of unhealthy workers and the failure of job applicants to land work: Impaired vision, impaired hearing, tuberculosis, heart disease, hernia, social diseases, pyorrhea, chronic stomach and kidney disorders and physical deformities of various types.

City's Stations Distributed 47,413 Pints of Certified Milk.

The patronage at the various milk stations conducted by the Cincinnati health department during the summer was the best in the history of the movement in that city.

"Nine milk stations and baby clinics were operated by the health department from June 4 to September 11, 1915. Daily clinics were conducted at the various centers, with the district physicians in attendance.

"Seven hundred and forty-three cases were registered, classified as follows: Breast-fed babies under observation, 188; bottle-fed babies, 301; nursing mothers, 46; malnourished children under the age of 3, not bottle-fed, 230.

"Four thousand and forty-three home visits were made by the nurses, teaching parents how to care for their babies, instructing them in the proper modification of milk and correcting fundamental errors in the home.

"As a result of conference with the district physicians many physical defects were discovered and corrected.

"Six deaths were recorded among those registered. In practically all instances the deaths occurred among children who were extreme cases at the time they applied at the clinics. Three cases in particular were under treatment by private physicians, the milk-station nurses supplementing and supplying certified milk.

"Forty-seven thousand four hundred and thirteen pints of certified milk were sold at cost (4.5 cents per pint), and 18,247 pints were given away, through the Union Bethel Taft Endowment. Ice tickets furnished by Mr. John R. McLean were distributed to the poor."

Lack of Funds.

Difficulties that will confront the Cincinnati health department the coming year, unless additional funds are forthcoming for its maintenance, were presented at a special meeting of the board of health in a prepared statement by Health Officer Landis.

Dr. Landis, in his statement, says among other things:

"No new work can be attempted in 1916, and much that is now being done will have to be abandoned. Thirty-five per cent. less money than is being expended in 1915 means that numerous lines of inspection will become things of the past. The health department budget for 1915 was a little in excess of \$102,000. That allowed for 1916 is a little in excess of \$67,000.

"In the Division of Food Inspection it will be necessary to eliminate meat, commission houses, market, cold storage, kitchen and miscellaneous food inspection.

"The same general reasons apply to the abandoning inspection of stores, restaurants, cold storage plants, and all other lines of business handling food products.

"In the Division of Medical Inspection it will be necessary to abandon the school nursing service, withdraw the aid now given toward the support of the tuberculosis clinic and close the dental clinics.

"In the Division of Sanitation it will compel the department to eliminate the bulk of inspection now done, and which we recognize as being entirely inadequate to meet our needs. The reduction of our general death rate in 1914 to a point below sixteen per thousand of population can in part be credited to this division, for in the past five years it has, among other things, eliminated over 12,000 disease and nuisance breeding outside toilets.

"Curtailling the work of this division means giving up bake shop, barber shop, saloon and other fields of inspection. Through this earnest band of men sanitary conditions in workshops and factories have improved more in the five years it has been in operation than in any previous ten years in the city's history.

"The Division of Vital Statistics and the Division of Laboratory will suffer no reduction in force.

"It is recommended that the present form of organization be retained, and that the health officer and chiefs of divisions be instructed to prepare a budget for the first six months of 1916, based on the allowance set aside by the Budget Commission."

CURRENT COMMENT ON MATTERS OF PUBLIC HEALTH AND SANITATION.

British Report on Painters' Lead Poisoning.

Four years ago the British Home Office appointed a committee to inquire into the extent, causes and prevention of lead poisoning among painters. The report of this committee, which has been engaged in taking evidence from a large number of expert witnesses, has been awaited with much interest by master-painters and sanitarians in this country, for until now Great Britain has not had any laws regulating the use of white lead paints, as have so many of the continental countries.

The report is more drastic than most people expected. It proposes to limit the amount of soluble lead in paint used for buildings to five per cent. of the pigment portion. It simply allows the use of certain lead colors, hard to replace, such as the green used for window shutters; and also lead dryers and lead boiled linseed oil, but not white lead or red lead as pigments.

A minority report by a master-painter, member of the committee, advises regulation instead of prohibition; but in their testimony before the committee, most of the master-painters were for prohibition. The workmen's compensation act has compelled the master-painter to pay compensation for lead poisoning which develops in a workman in his employ, because he is the last employer. Yet the public continues to demand that he use lead paint. For his own protection he wants to be forbidden to use lead paint.

The report of the committee is only a recommendation and the trade journals in this country which comment on it, point out the importance of the British white lead industry and the unlikelihood that it will quietly submit to extinction. Moreover, zinc oxide, the substitute recommended, is not made in England, and to make it they would be obliged to use the spelter, which is now in such urgent demand for the brass needed for ammunition.

On the whole, the prospects are not bright for protective legislation of this or any other kind in England until the war is over.—*Abst. The Survey*, 1915.

Sick Babies.

"My baby's sick. What shall I do?" That's a very common question from mothers, particularly at this time of year. It is a very important question, too, and one that is hard to answer fully. In general the chances are more than ten to one that the trouble is from some digestive disturbance. For this reason it is always advisable to stop feeding the baby at once. He won't starve if he misses a few meals or even if his rations are shut off or greatly reduced for several days. Of course, the baby should be given all the water he cares for. All drinking water for babies should be boiled, then bottled, and served cool but not iced.

The next thing to do for a sick baby after stopping the food supply is to empty the intestines of all fermenting, decomposing food. In general, the mother will be justified in using not over a teaspoonful of castor oil or simple

enemas by injection. If this does not bring relief the next step should be to call in the best physician available and place the case fully in his hands.

As with many other health matters prevention is much simpler, cheaper, and better than cure. In the case of babies the use of mother's milk as food is the first and most important single item to be considered. In summer the baby should be kept cool, clean and free from flies. Babies should live in the fresh air at all times, and carefully screened from mosquitoes. — *North Carolina Bulletin*, 1915.

Medical Aspects of Open Air Schools.

There are 20,000,000 school children in the United States. Education is compulsory; this is one of the only fields in which the United States concerns itself with the direction of the individual to this same degree. So writes Sherman G. Kingsley in an article on open air schools. Twelve million of these children are known to have more or less serious physical defects and yet they are kept in close, ill-ventilated and overcrowded rooms until they are half asphyxiated. Open air schools are feasible in almost all communities throughout the entire year. In many cold climates during a short period frequently opened windows may have to take the place of open air schools *per se*.

The Elizabeth McCormick Fund has made the open air school problem a special care. The schools were filled with anæmic, under-nourished children of homes which were small, crowded, and where the family income was low, the average being \$7.02 per individual per month. The requirements necessary for such work with children of this type are a thorough knowledge of the family history, home conditions, careful study by competent physicians of children's health and mentality, specially chosen teachers of the highest type, very small classes and proper rest and feeding.

The results are improvement in hæmoglobin tests, gain in weight—the children gain as much or more than normal children, in ten months the average gain in weight is four and a half pounds—and mental alertness, which is very markedly increased.

Many of the cities have open window rooms but this is hardly enough in all cases. Even if the weather is severe much can still be accomplished if children are properly equipped. — *Abst., J. A. M. A.*, 1915.

Public Health.

The decision of the board of education to appoint a dentist to examine the children in the public schools has assisted in arousing interest in Springfield in the question of public health. Members of the city health department are hoping that the board will take action in the near future to put the decision into actual operation.

The matter of public health is one of great concern and it is gratifying to note that the interest in it is increasing. Springfield has been taking some advanced steps in recent years, and more attention is being given to the health of the city than at any other time.

Figures furnished by Dr. J. R. McDowell, health director of Springfield, give an idea of the importance of the health department to the community.

During the year of 1914, there were 87 deaths in Springfield from preventable diseases. Pulmonary tuberculosis, typhoid fever, diphtheria, scarlet fever, smallpox, whooping cough and measles come under the head of preventable diseases. Statistics compiled by organizations which have made a study of the problem, place the value of a man's life to a community at \$2,900. For the 87 deaths the loss to Springfield in 1914 was \$252,300.

Dr. McDowell explains that there were 773 cases of communicable diseases which came under the attention of the department in 1914. A case of measles, chickenpox or whooping cough costs some person \$10, he explains. Diphtheria and scarlet fever cost \$30. A case of smallpox costs some one \$200. A case of typhoid fever costs a like amount, while a case of tuberculosis costs some one approximately \$3,000. This means that the total number of preventable cases in 1914 in Springfield, cost \$256,000, making the total loss from deaths and preventable diseases reach the startling sum of \$508,300.

The total appropriation for the health department in 1914 was \$7,937. This is 15.8 cents per capita.

For comparison and without criticising any other department, Dr. McDowell also furnished other figures. The appropriation of the money used by the fire department in 1914 was \$51,415.28. This was \$1.02 per capita. The fire property loss in 1914 was \$209,541. There was no loss of life from fire.

In the police department \$38,643.32 were used in 1914, according to Dr. McDowell, making 77 cents per capita. The police property loss was \$10,674.10, of which \$7,219.74 were recovered, making a loss in property of \$3,454.35. There was one loss of life which, valued at \$2,900, makes the loss in the police department total \$6,354.36.

Dr. McDowell explains that the loss from health is more than 39 times that of theft and murder, while the appropriation for theft and murder is almost seven times the appropriation for health. The fire loss is half that of health while the appropriation is more than seven times that of the health department, he explained.

These figures are given in order to emphasize the importance of the health department to the community. They were brought out by Dr. McDowell during his discussion of a paper on health which he read before the members of the Young Men's Literary Club Friday night.

During recent months The Daily News has been publishing articles on health provided by men of authority on health matters. Health officers and physicians declare that considerable headway is being made in the health work of the country, but that it is necessary to conduct a campaign of education. The figures provided by Dr. McDowell furnish a basis for deep thought and consideration. They do not mean that the health condition is any worse in Springfield than in other communities.

It is certain that the health work is attracting more attention each year and the realization prevails that it is just as essential, if not more so, to safeguard lives against diseases as it is to protect property and lives from fire, thieves and murderers. — *Springfield News*, 1915.

Court Decisions Relating to Public Health.

A RESUME OF RECENT JUDICIAL OPINIONS ON MATTERS AFFECTING PUBLIC HEALTH ADMINISTRATION.

The following is a brief résumé of recent opinions rendered by judges in federal and state courts on subjects which are of special interest to persons engaged in public health work:

OCCUPATIONAL DISEASES AND WORKMEN'S COMPENSATION LAWS.

The Supreme Court of Massachusetts rendered a number of decisions holding that workmen (or, in case of death, their dependents,) were entitled to compensation under the Massachusetts workmen's compensation law, when the injury for which recovery was sought resulted from industrial diseases and not from "accidents" in the usual acceptance of that term.

In one of these cases it was held that blindness resulting from an acute attack of optic neuritis, induced by poisonous coal-tar gases, is a "personal injury arising out of and in the course of" employment within the meaning of the Massachusetts law providing for compensation for injuries to workmen. —(Public Health Reports, June 12, 1914, p. 1583).

In the next case where this principle was involved the court held that under the workmen's compensation act of Massachusetts the term "personal injury" is not limited to injuries caused by external violence, physical force, or as the result of "accidents" in the sense in which that word is commonly used, but under the statute is to be given a much broader and more liberal meaning, and includes any bodily injury. It includes any injury or disease which arises out of and in the course of the employment and causes incapacity for work. Lead poisoning, according to the Massachusetts act, is therefore a "personal injury," if incurred by the employee during the course of his employment. (Public Health Reports, July 3, 1914, p. 1781.)

A third decision was to the same effect. A cook employed on a lighter was suffering from valvular disease of the heart. The disease was aggravated by his exertions in saving his personal effects when the lighter sank, and he died soon after. The industrial accident board found that the death of the employee arose out of and in the course of his employment and the supreme court supported this view. (Public Health Reports, May 14, 1915, p. 1455.)

The Supreme Court of the State of Michigan, on the contrary, decided that occupational diseases were not included within the provisions of the Michigan compensation act. The law differs somewhat from the Massachusetts law, and the justice who wrote the opinion said: "It was not the intention of the legislature to provide compensation for industrial or occupational diseases, but for injuries arising from accidents alone." In reversing an award made by the industrial accident board of the State to the widow of an employee who died as a result of red-lead poisoning, the supreme court pointed out that if it had been the intention of the legislature to include occupational diseases, the clause would have been unconstitutional, since the title refers merely to "accidental" deaths and injuries and Michigan has a constitutional provision requiring the title of any law fully to express the object of the law. (Public Health Reports, Nov. 6, 1914, p. 2999.)—*U. S. Public Health Reports*, 1915.

Marriage of Tuberculous Persons.

A JUDICIAL DECISION ANNULING THE MARRIAGE OF A PERSON WHO CONCEALED THE FACT THAT HE WAS SUFFERING FROM TUBERCULOSIS.

The courts have held in a number of instances that the marriage of a person suffering from a venereal disease might be annulled at the instance of the other party to the marriage when the existence of the disease had been concealed. The Supreme Court of the State of New York, in *Sobol v. Sobol* (p. 3175 of this issue of the Public Health Reports) carries this legal principle one step farther.

The defendant (the husband) had been treated for tuberculosis and knew that he was suffering from the disease. He concealed this fact from his fiancée, and explained certain symptoms by saying that he was suffering from a cold. After the marriage his wife discovered the nature of his illness and brought suit to annul the marriage. No issue resulted from the union.

The court decided that, in view of the possible serious consequences of such a marriage to the wife, to the children if any should be born, and to the community, the marriage contract should be annulled. The legal basis of the decision was the fraud of the defendant in concealing and misrepresenting the condition of his health.

Schools and Epidemics.

NO SCHOOL SHOULD CLOSE ON ACCOUNT OF EPIDEMIC OF CONTAGIOUS DISEASE.

The plan of closing school in case of an epidemic of some contagious disease is the old and ineffective way of dealing with such a situation, and was adopted for the reason there was apparently nothing else to do. But, according to a bulletin recently issued by the State Board of Health, there is another way, a scientific and efficient means, of dealing with an epidemic in school. This way does not close the school at all but uses the school as a most valuable aid in keeping the children under observation, that early cases may be detected and removed before they become a source of infection to the other children. "In case a school has no nurse or school physician," says the bulletin, "a physician's services can be secured for the daily examinations while the epidemic lasts and both, parents and the health officer or quarantine officer, can be notified and the epidemic soon brought under control."

On the other hand, if the schools are closed when an outbreak occurs, the children are turned loose from supervision; they mingle freely with one another in the streets and in each others' homes; they are unwilling to admit they feel ill for the reason it will be the end of their good time and consequently when one does "come down" with the disease, usually it was not detected until he had infected his brothers and sisters and perhaps his playmates. Often-times, in such cases, the parents call the physician too late.

According to the bulletin, no school should close on account of contagious diseases. If the teacher is alert and the health officer on the job, an epidemic can be avoided or so controlled that there will be no loss of time on the part of the school as a whole. Not for four years has a school of New York City closed on account of an epidemic of a contagious disease.—*North Carolina Bulletin*, 1915.

Wounds and Skin Diphtheria.

In spite of the fact that diphtheria is one of the most easily controlled of communicable diseases, cases continue to spread in spite of quarantine and isolation of cases and carriers. Wound and skin diphtheria, unrecognized and unreported is one of the sources of this continued spread. Diphtheria may be properly divided into two classes, fancial and extrafancial. Comparatively little attention has been directed to the latter class until recently. Extrafancial cases, or cases of skin and wound diphtheria, are more dangerous than fancial diphtheria because they are not so frequently recognized, the bacilli are on the exposed surfaces of the body, and the duration is longer. Cases of three years' duration have been reported. Instances of outbreaks of diphtheria traceable to extrafancial diphtheria are not rare in the literature. Open wounds and skin lesions should also be protected from diphtheria. One interesting case of extrafancial diphtheria reported by the author was that of a woman operated upon for gallstones on April 11, 1914. Diphtheria developed in the wound, but was not recognized until the middle of July. Treatment with a spray of lactic acid bacilli was successful in effecting a cure. Wounds which heal slowly should be cultured for the diphtheria bacillus as a routine. and all open wounds and skin lesions should be protected from contact with a case. — *Abst. Am. Jour. Pub. Health*, 1915.

Accidents Following Vaccination.

It is increasingly difficult to enforce vaccination of school children because of the activity of anti-vaccinationists in exaggerating the number and character of the complications of vaccination. Such diseases as cancer, consumption, typhoid fever, diphtheria, leprosy, infantine paralysis and epidemic cerebro-spinal meningitis have been ascribed to vaccination, but the accusation is so obviously unjust that it is not necessary to consider it here. The development of tetanus has been the main argument used by anti-vaccinationists. The author has collected histories of eighty-two cases of tetanus in subjects recently vaccinated. Fifty-four of the eighty-two have histories showing the possibility of subsequent infection of the vaccination wound, such as an improperly used shield, dirty dressings, and traumatism. Tetanus was much longer in developing than the usual incubation period of the disease. Nearly seventy per cent of the cases developed tetanus in from two to over four weeks. This would indicate infection subsequent to vaccination. To show that tetanus follows any wounds just as frequently as vaccination scarifications the following statistics from the coroner's record of Philadelphia are of value:

PERIOD 1909-1912 INCLUSIVE.

Total virus distributed by health department.....	190,427
Total cases of tetanus reported.....	83
Post vaccinal tetanus.....	13

At least double the amount of virus indicated was distributed by private firms in Philadelphia during this period. It is almost impossible for the tetanus bacillus to escape detection by the rigid tests required by the Public Health Service. Carini has shown that even should a few bacilli escape detection by

these tests, the number would be too small to cause infection. Although the large majority of cases of post vaccinal tetanus are due to infection subsequent to the operation, the measures to prevent tetanus should always be enforced. They are:

1. Proper cleansing of the field of operation.
2. Scarification by linear incision (Dock).
3. If any infection appears treat promptly as in any other infectious process.
4. Education of patient and parents and weekly examination of the process.
5. Vaccinate only in Winter or Spring, unless smallpox be present. This is on account of the fact that a large majority of the cases of tetanus develop in the late summer and autumn months. Certificates of vaccination from school children should therefore be required in the winter or spring rather than in the fall as at present.—*Abs. Am. Jour. of Pub. Health*, 1915.

The Use of Convalescent and Normal Blood in the Treatment of Scarlet Fever.

The use of intra-muscular injections of fresh human blood, either convalescent or normal, in cases of scarlet fever with a bad prognosis has been quite encouraging in the Willard Parker Hospital. Six or eight ounces are used and repeated once or twice at intervals of four or five days. The intravenous use of convalescent serum has already given good results but it entails considerable wastage and some difficulty. Absorption from the muscles is quite rapid. This method is useful in the early toxic or malignant scarlet fever cases when seen in the first three or four days. Within six hours there is a drop of temperature to normal, the rash fades, and the pulse improves. The use of intra-muscular injections of blood is also useful in the later septic cases, seen between the fifth and eighth days of the disease. The rash may have disappeared but the pharyngeal symptoms are severe. The pulse is small and rapid and duskiens of the skin is present. The infection of normal or convalescent blood in these cases gives very encouraging results. Twenty-three patients at the Willard Parker Hospital were treated with intramuscular injections of citrated blood. They represent the cases with the poorest prognosis out of a total of some nine hundred cases. Fifteen of the twenty-three patients received convalescent blood. Four of these died, two of which were moribund at the time of injection. Of the eight patients who received normal blood, none died. It is hoped that this method of treatment will be continued until a sufficiently large series of cases is obtained to draw accurate conclusions as to its value.—*Abstr. J. A. M. A.*, 1915.

Controlling Cancer in England.

Portsmouth was the first municipality in England to undertake a public educational campaign for the control of cancer and it would appear that the measures adopted in 1913 are already taking effect. The annual report of the Medical Officer of Health, Dr. A. Mearns Fraser, for the year 1914, which has just been received, states that there were only 197 deaths from cancer in Portsmouth last year as compared with 230 in 1913. This decrease, which occurs in the face of an increase of population, is hailed with satisfaction by the

Portsmouth sanitary authorities as justifying their efforts to reduce the cancer death rate by persuading persons who are attacked with this disease to avoid delay and to seek treatment before it is too late for more than palliative measures. Dr. Fraser reports that from statements made to him by local medical men the publication of circulars and newspaper articles by the Health Department has been instrumental in inducing a number of persons suffering from early operable cancer to secure treatment, the result of which it is hoped will be permanent.

When the educational measures were put in force two years ago, the cancer death rate of the city had for a long period been increasing. Twenty years ago the average death rate from cancer in Portsmouth was 6.79 per 10,000 of the population, but in 1913 it had risen to 9.16 per 10,000. In that year the total number of deaths was only 34 less than were caused by tuberculosis. While admitting that the increase in the recorded cancer death rate might have been caused in part by improved methods of diagnosis, the Health Committee of the Portsmouth Town Council nevertheless believed that the present number of deaths was unnecessarily large, and they felt it incumbent to adopt whatever measures might lessen the ravages of the disease. The initiative came from Dr. Charles P. Childe, senior surgeon of the Royal Portsmouth Hospital and a member of the Health Committee of the Town Council. As early as 1906 Dr. Childe in his book "The Control of the Scourge" had given to the public the benefit of his extended experience with cancer. At his suggestion the Portsmouth authorities in 1913 began a campaign of public education under the official auspices of the Health Department. The methods adopted included the monthly publication in the local newspapers of articles regarding cancer and the printing and distribution of a Health Department circular on the subject. Arrangements were made for periodical lectures to midwives, nurses, and to those engaged in social work in Portsmouth. The Health Department further made provision for free microscopical examinations and reports on suspected cancerous growths in order to assist physicians in immediate diagnosis in the case of patients who were unable to pay for such laboratory service. The experience of the Portsmouth authorities had been that by far the majority of patients who presented themselves at hospitals suffering from cancer exhibited the disease in a stage too advanced to be cured. It was held that the reason for this delay in seeking advice was not as a rule because patients feared operation, but because they were ignorant that they were suffering from anything serious until they began to suffer pain. The fact that cancer at its onset is almost always painless should be widely realized in order that the public may learn the importance of other symptoms which will enable them to recognize the disease in the early stages when it can nearly always be successfully removed by competent surgery.

The Common Washrag More Dangerous Than the Common Towel.

The U. S. Public Health Service and the various State and local boards of health have taken adequate measures for the abolition of that distributor of disease germs, the common towel. Now comes the news that the common washrag is even a greater menace to health. The hotels and public hostleries have recognized this for some time, and have supplied their guests with sterilized wash cloths in individual sealed packets. The damp "sour" smelling

washrag still exists, however, in many private bath rooms. Imperfectly washed out after use, frequently not wrung out at all, it is often hung over a rack or a radiator near an open window there to collect dust and dirt. Frequently the same washrag is used by the entire family, thus affording an easy means of transference of mouth secretions from person to person. In many households each individual has his own wash cloth and his individual towel, but these hang so close to one another that there is ready interchange of bacteria. Each individual should have his own wash cloth. It should be thoroughly washed out with clean hot water after use. It should be then wrung as nearly dry as possible, and if possible hung in the sun to dry. It should not come in contact with other wash cloths. In the investigations the U. S. Public Health Service is conducting in regard to the prevalence of trachoma it has been found that common towels probably acted as a medium of distribution of the germ of disease.

Typhus Fever In Palestine, 1913-1914.

A recent outbreak of typhus fever in Palestine is interesting in the light of the present epidemic in Serbia. Previous to 1913, 1914, the disease was rare in Palestine, although isolated outbreaks were not unknown. In the spring of 1913 a family was admitted to the English Mission Hospital. The disease was mild in the younger members of the family but extremely virulent in the adults. The disease spread but only one death occurred in a series of twenty cases. Later Hebron was swept with the disease and an exodus took place. Again there was a lull until the spring of 1914, when another outbreak occurred, the cases being first diagnosed as typhoid fever. The severity of the disease appears to depend upon the age of the patient and his hygienic environment. In the hospital the case fatality rate was 5%, while in outside cases it was 50% in a series of one hundred and eighty patients. The disease is supposed to be carried by the louse, but some cases of transmission in our series could hardly be explained in this way. The common complications of typhus fever are cardiac degeneration, bronchitis and pleurisy. The sequelae are ostomalacia, lung abscess and bronchiectasis. Good nursing is an essential in the treatment, and good hygienic surroundings are also necessary. Sleeplessness must be combated with discretion and determination. Digitalis should be avoided, but brandy and strychnine are useful therapeutic agents. Quinine and sodium sulphocarbolate are useful bactericides. Nurses are more subject to infection than physicians, for their clothing is of such a nature that lice are more readily collected. — *Abr. British Med. Jour.* 1915.

Typhus Fever Abroad Menaces U. S.

FEDERAL QUARANTINE OFFICIALS WATCHFUL.

While the epidemic of typhus fever in Europe seems to be on the decrease because the little insect which transmits it paradoxically goes into winter quarters in summer, the United States Public Health Service has issued a warning to all quarantine officers to keep a sharp lookout for the disease among passengers arriving from Greek and Italian ports. The overcrowding, lack of bathing facilities, and general insanitary conditions brought about by

the state of war in Europe have made the fiscal year 1914-15 a typhus year. The extensive outbreak which occurred in Austria-Hungary and Serbia is probably responsible for the introduction of the disease into Germany, but as immigration from these countries is at the present time practically nil the Government's sanitary corps considers passengers from Greece and Italy of greater potential health menace. The disease has also been reported in Spain; at Zurich and St. Gall in Switzerland; and Moscow, Odessa, Petrograd and Warsaw in Russia.

Mobile Laboratories With the Army in France.

The introduction into field operations of mobile laboratories is one of the outstanding features of the medical arrangements of the British Expeditionary Force. In the early stage of the war there were only one or two of them, but now there is quite a fleet. Each can do its work, if necessary, even in a neighborhood where buildings are entirely lacking. The common aim of the laboratories is to provide any additional scientific data which may from time to time be required when the general principles of preventive medicine are being applied at the real front. They therefore seek to lessen the wastage due to contagion, air-borne, food-borne, or water-borne disease. The work done includes the testing of urine of every man of a whole division who was known or suspected to have previously suffered from enteric fever, with a view to the discovery and removal of carriers; the diagnosis of cerebro-spinal meningitis and the watching of contacts and supervising bacteriologically the treatment of acute cases of this disease by various specifics. Some very useful work has been done in dealing with the typhoid fever epidemic among the Flemish; in addition to all actual cases being brought under treatment, and the homes of the patients put into proper sanitary condition. Over 20,000 people applied for antityphoid inoculation and about 80 per cent. of these returned for the desirable second dose. The whole business of dealing with zymotic disease has been excellent; the zymotic morbidity curve, and especially the typhoid curve, has been, so far, kept down to a satisfactory low level which, considering the number of men, is noteworthy. — *The Journal of State Medicine*, 1915.

The So-Called New Antiseptic.

The newspapers have recently given considerable publicity to a so-called new antiseptic said to be used with considerable success on the wounded and credited to Drs. Carrel and Dakin. This antiseptic was first described by Dakin of the Herter Laboratory, New York, and is made by adding sodium carbonate to a solution of chlorinated lime. The mixture is thoroughly shaken, allowed to stand; the clear liquid is siphoned off and enough boric acid is added to the filtered liquid to make it neutral or acid. Chlorinated lime, itself an active antiseptic, is too irritating to be used on human beings. The new antiseptic is neutral and non-irritating and may be applied in greater strength than chlorinated lime. The method is not new from the chemical point of view, and Vincent in 1914 used it clinically with some success. — *Abstr. J. A. M. A.*, 1915.

A New Disinfectant.

As a result of experiments conducted at the Hygienic Laboratory of the United States Public Health Service it is announced that a new disinfectant, possessing qualities superior to ordinary disinfectants, has recently been discovered. The announcement is particularly important at this time, coming as it does in the face of the shortage in coal tar derivatives which has resulted from the European conflict.

The new preparation is derived from pine oil, a by-product in the manufacture of turpentine. It is easily prepared by mixing certain proportions of the oil with rosin and sodium hydroxide solution, the finished product being a reddish-brown liquid, rather thick and oily in appearance but free from turbidity. With water it makes a perfectly white emulsion, much resembling milk. It has a pleasing odor, no objectionable taste, and attacks neither fabrics nor metals. It possesses over four times the disinfectant properties of carbolic acid and is altogether nontoxic, so that it may safely be used as a throat spray or mouth wash in solutions of the ordinary strength. The cost of the preparation is remarkably low as it can be manufactured for less than fifty cents a gallon, solely from products which are produced in this country.

Many of the disinfectants now on the market are neither efficient nor economical, it having been demonstrated that a number of the most expensive and widely advertised are extremely weak in disinfecting power, so much so that their strength is underterminable by ordinary methods. The sale of compounds of this nature constitutes a fraud. A second class of proprietary preparations are of guaranteed strength, thus putting a legal responsibility upon the manufacturer, but the cost of these per unit of disinfecting power is frequently excessive. The householder is therefore often at a loss to select a disinfectant which is efficient, economical and of constant strength. and it is believed that this new compound, which is to be known as "Hygienic Laboratory Pine-oil Disinfectant", will become one of the most useful preparations of that character.

Fumigation vs. Cleanliness.

There has been much discussion among public health officials regarding the action of the New York City Board of Health in discontinuing fumigation after infectious diseases. In order to compare results, fumigation was discontinued in Manhattan, the Bronx, Queens, and Richmond, but was continued in Brooklyn. Thorough cleaning, fresh air, and sunlight, together with clean paper and repainting were substituted for fumigation in the infected houses. The change was made in December 1914, and since that time there has been no increase in the number of cases of infectious disease. It is estimated that the city saves \$30,000 annually by discontinuing fumigation. The proper cleaning and renovating are forced upon the owner of the building and the quarantine placard is not removed until the orders of the board of health are fulfilled.

A comparison of the following figures show the results obtained in Brooklyn and Manhattan. In Manhattan there were 3,451 primary cases of diphtheria and only 193 secondary cases. Of this number only 22 or 0.6 per cent might have been affected by fumigation.

In Brooklyn where fumigation was performed there were 138 secondary cases following only 2,907 primary cases, while 28 or 0.9 per cent would have been affected by fumigation. This shows that there were half again as many secondary cases in Brooklyn as in Manhattan.

In the scarlet fever reports the results were about the same for both places. It would seem from the above tables that fumigation does not necessarily reduce the number of cases of infectious disease and that other methods of purification are as effective as the use of formaldehyde, etc. — *Abs. Lancet Clinic, 1915.*

REPORTED CASES OF NOTIFIABLE DISEASES FOR THE FIRST SIX MONTHS OF 1915, BY CITY DISTRICTS AND BY VILLAGE AND TOWNSHIP DISTRICTS.

	Totals for all Districts.	Totals for City Districts.	Totals for Village and Township Districts
Totals	52,879	28,678	24,201
Tuberculosis (All forms)	3,642	2,909	733
Pneumonia	3,316	1,533	1,783
Typhoid fever	1,345	862	483
Diphtheria	3,251	2,368	883
Whooping cough	3,922	1,807	2,115
Measles	14,694	7,939	6,755
Scarlet fever	4,700	2,346	2,354
Chickenpox	6,707	3,821	2,886
Smallpox	2,390	718	1,672
Mumps	5,231	2,033	3,198
Gonorrhea	1,329	728	601
Syphilis	546	418	128
German Measles	1,029	600	429
Epidemic Cerebrospinal Meningitis	81	57	24
Acute anterior poliomyelitis	31	16	15
Ophthalmia neonatorum	423	378	45
Trachoma	175	112	63
Tetanus	14	8	6
Dysentery	1	....	1
Septic Sore Throat	17	4	13
Paratyphoid fever	6	5	1
Malaria	16	8	8
Continued fever	4	1	3
Rabies	2	2	....
Trichinosis	2	1	1
Pellagra	2	1	1
Typhus fever	1	1	....
Anthrax	1	1	....
Favus	1	1	....

COMMUNICABLE DISEASES.

MONTHLY TOTALS OF REPORTED CASES FOR THE SIX MONTHS,
JANUARY-JUNE, 1915.

	Jan.	Feb.	Mar.	Apr.	May.	June.	Total.
Totals	9,134	7,354	9,492	10,145	8,848	7,906	52,879
Tuberculosis (All forms)	544	560	645	730	580	583	3,642
Pneumonia	583	718	1,073	564	218	160	3,316
Typhoid fever	301	180	196	182	214	272	1,345
Diphtheria	827	563	590	474	421	376	3,251
Whooping cough	616	416	516	706	846	822	3,922
Measles	1,079	1,192	2,026	3,423	3,610	3,364	14,694
Scarlet fever	1,116	834	847	806	676	421	4,700
Chickenpox	2,121	1,136	1,092	1,090	711	557	6,707
Smallpox	366	356	452	509	337	370	2,390
Mumps	1,165	953	1,187	873	616	437	5,231
Gonorrhea	170	176	376	172	196	239	1,329
Syphilis	30	72	171	107	80	86	546
German measles	96	82	168	356	217	110	1,029
Epidemic cerebro-spinal meningitis...	15	16	18	18	13	6	81
Acute anterior poliomyelitis	4	8	2	6	3	8	31
Ophthalmia neonatorum	81	56	84	80	64	58	423
Trachoma	18	32	37	34	31	23	175
Tetanus .....	....	1	2	5	2	4	14
Dysentery .....	....	....	....	....	1	....	1
Septic sore throat....	1	2	9	2	3	....	17
Paratyphoid fever....	....	....	2	1	....	3	6
Malaria .....	....	....	1	4	7	4	16
Pellagra .....	....	....	....	1	....	1	2
Anthrax .....	....	....	....	1	....	....	1
Continued fever .....	....	1	2	....	1	....	4
Favus	1	....	....	....	....	....	1
Rabies .....	....	....	....	....	....	2	2
Trichinosis .....	....	....	1	1	....	....	2
Typhus fever .....	....	....	....	....	1	....	1

**REPORT OF THE HYGIENIC LABORATORIES, OHIO
STATE BOARD OF HEALTH, FOR THE MONTH
ENDING OCTOBER 31, 1915.**

Diphtheria: Positive 71, Negative 202, Suspicious 29.....	302
Tuberculosis: Positive 63, Negative 217.....	280
Typhoid: Positive 20, Negative 73, Atypical 21.....	114
Rabies: Positive 8, Negative 3, Unsatisfactory 2.....	13
Miscellaneous	22
Water, chemical	36
Water, Bacteriological	206
Sewage: Chemical 0, Bacteriological 10.....	10
From State Agricultural Commission.....	102
Total number of examinations.....	1,085

Distribution of Outfits.

Water and Sewage: Chemical 53, Bacterial 291.....	344
Diphtheria	597
Tuberculosis	786
Typhoid	251
Malaria	25
Ophthalmia	979
Total outfits distributed.....	2,982

**REPORTED CASES OF NOTIFIABLE COMMUNICABLE
DISEASES, OCTOBER, 1915.**

	Cities.	Townships and Villages.	Total.
Tuberculosis (all forms).....	335	57	392
Pneumonia	110	40	150
Typhoid fever	256	346	602
Diphtheria	966	447	1,413
Whooping cough	212	181	393
Measles	148	105	253
Scarlet fever	492	390	882
Chickenpox	150	272	422
Smallpox	35	51	86
Mumps	43	43	86
Gonorrhea	119	87	206
Syphilis	66	11	77
German measles	6	3	9
Epidemic cerebro-spinal meningitis.....	11	8	19
Acute anterior poliomyelitis.....	52	31	83
Ophthalmia neonatorum	80	8	88
Trachoma	57	6	63
Tetanus	1		1
Malaria	8		8
Paratyphoid fever	1		1
Rabies	1		1
Septic sore throat.....		1	1
Chancroids	3		3

COMMUNICABLE DISEASES, OCTOBER, 1915.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
ADAMS COUNTY—										
Peebles	Vu.	1				2				
West Union	Vu.			2						
Green	Tp.		2	5						
Meigs	Tp.			9						
Tiffin	Tp.			3						
Wayne	Tp.	1								
ALLEN COUNTY—										
Delphos					4		7			
Lima		3	2	6	7	1	5	3		2
Lafayette	Vu.						1			
Bath	Tp.			4						
German	Tp.		1							
Marion	Tp.						1			
Perry	Tp.			1			1			
Sugar Creek	Tp.				4			12		
ASHLAND COUNTY—										
Ashland				1	3			1		
Perry	Tp.	1								
ASHTABULA COUNTY—										
Ashtabula			2	4	1		1			
Conneaut			1	2			7			
Geneva	Vu.			1						
Rock Creek	Vu.						2			
Ashtabula	Tp.	1								
Austinburg	Tp.							1		
Cherry Valley	Tp.							1		
Conneaut	Tp.	1		1				1		
Jefferson	Tp.				2					
Morgan	Tp.						1			
Saybrook	Tp.			2						
ATHENS COUNTY—										
Athens				1			4			1
Nelsonville			1	5						
Chauncey	Vu.		3	1			1	2		
Glouster	Vu.			1						
Jacksonville	Vu.			3						
Athens	Vu.				3					
Canaan	Tp.						1			
Dover	Tp.		3	6			1			
Trimble	Tp.		1	6						
Waterloo	Tp.			1						
York	Tp.			5						
AUGLAIZE COUNTY—										
St. Marys				1			10			
Wapakoneta							4			
Minster	Vu.							2		
New Knoxville	Vu.		2							
Clay	Tp.		1				1			
Duchonquet	Tp.		2				1			
Logan	Tp.			1						
Moulton	Tp.						4			
Noble	Tp.						1			
St. Marys	Tp.		1							
Washington	Tp.		1				4			
Wayne	Tp.		4							
BELMONT COUNTY—										
Bellaire			2	3	7		3			
Martins Ferry			1	10		3	1	1		
Barnesville	Vu.		1				1			
Holloway	Vu.		1	1						
Colerain	Tp.			1			1			
Goshen	Tp.						4			
Pultney	Tp.		2	1		1				

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
BELMONT COUNTY—Concluded.										
Richland	Tp.						3	1		
Smith	Tp.				6					
Somerset	Tp.						2			
Wayne	Tp.			1			15			
Wheeling	Tp.		1							
BROWN COUNTY—										
Aberdeen	Vil.				3					
Ripley	Vil.	1	2					1		
Byrd	Tp.							3		
Clark	Tp.						2			
Huntington	Tp.		1							
Jefferson	Tp.		2							
Perry	Tp.	1								
Scott	Tp.		1							
Sterling	Tp.		1					2		
Union	Tp.	1	1							
Washington	Tp.		1						1	
BUTLER COUNTY—										
Hamilton		6	1	1	5	2	4	2		1
Middletown		2	6	2	23	1	2	1		
Oxford	Vil.			4						
Fairfield	Tp.						3			
Madison	Tp.						1			
Milford	Tp.		1							
Rely	Tp.				2					
St. Clair	Tp.						1			
CARROLL COUNTY—										
Carrollton	Vil.			1						
Augusta	Tp.			1						
Brown	Tp.			1						
Fox	Tp.						2			
Lee	Tp.		1							
CHAMPAIGN COUNTY—										
Urbana			1		5					
St. Paris	Vil.									
Salem	Tp.		2							
CLARK COUNTY—										
Springfield		7		9	15	1	20	2		
Bethel	Tp.				4		1			
German	Tp.									
Madison	Tp.		1							
Springfield	Tp.	2		1	3		1			
CLERMONT COUNTY—										
Batavia	Vil.			2						
Milford	Vil.			5			2		1	
Moscow	Vil.		1							20
Williamsburg	Vil.					8				
Batavia	Tp.		1							
Franklin	Tp.			1						
Jackson	Tp.	1			12	2		3		
Monroe	Tp.				4					
Pierce	Tp.			2						
Union	Tp.	1			1					
Williamsburg	Tp.					3				
CLINTON COUNTY—										
Blanchester	Vil.	1		3						
New Vienna	Vil.							13		
Chester	Tp.						3			
Green	Tp.							21		
Jefferson	Tp.	1								
Union	Tp.									1
Wayne	Tp.								1	1

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
COLUMBIANA COUNTY—										
East Liverpool.....	1			8			1			
Salem.....			2			1	4			2
Wellsville.....	3	1		6			10			
Columbiana.....	<i>Vil.</i>						1			
East Palestine.....	<i>Vil.</i>	1	8	1		88	4			
Lisbon.....	<i>Vil.</i>			1						
Salineville.....	<i>Vil.</i>			1						
Butler.....	<i>Tp.</i>		1					1		
Hanover.....	<i>Tp.</i>			2						
Liverpool.....	<i>Tp.</i>						1			
Middletown.....	<i>Tp.</i>									2
St. Clair.....	<i>Tp.</i>			1			1			
Unity.....	<i>Tp.</i>			3		2	2			
West.....	<i>Tp.</i>									
COSHOCTON COUNTY—										
Coshocton.....							1		1	
Bedford.....	<i>Tp.</i>		3							
CRAWFORD COUNTY—										
Bucyrus.....			2	1						
New Washington.....	<i>Vil.</i>		1							
Holmes.....	<i>Tp.</i>		1							
CUYAHOGA COUNTY—										
Cleveland.....	110	75	34	244	51	64	69	17		12
East Cleveland.....					1		1			
Lakewood.....					2		5			1
Bedford.....	<i>Vil.</i>					2				
Berea.....	<i>Vil.</i>		1							
Chagrin Falls.....	<i>Vil.</i>	1								
East View.....	<i>Vil.</i>						2			
Olmsted Falls.....	<i>Vil.</i>							2		
Rocky River.....	<i>Vil.</i>		1							
Shaker Heights.....	<i>Vil.</i>					1				
West Park.....	<i>Vil.</i>			4			1			
Brook Park.....	<i>Vil.</i>			1			1			
Euclid.....	<i>Tp.</i>			1						
Mayfield.....	<i>Tp.</i>						1			
Royalton.....	<i>Tp.</i>	1	3			2	1			
Strongsville.....	<i>Tp.</i>						2			
Warrensville.....	<i>Tp.</i>		1	3		6				
DARKE COUNTY—										
Greenville.....						1	4			
Arcanum.....	<i>Vil.</i>		1							
Burkettsville.....	<i>Vil.</i>			4			1			
New Weston.....	<i>Vil.</i>	1						2		
Pittsburg.....	<i>Vil.</i>		1							
Union City.....	<i>Vil.</i>	1	2							
Versailles.....	<i>Vil.</i>						2			
Yorkshire.....	<i>Vil.</i>				7					
Allen.....	<i>Tp.</i>			5						
Greenville.....	<i>Tp.</i>						2			
Neave.....	<i>Tp.</i>						1			
Richland.....	<i>Tp.</i>						1			
York.....	<i>Tp.</i>						1			
DEFIANCE COUNTY—										
Defiance.....			2							
Milford.....	<i>Tp.</i>		2							
Tiffin.....	<i>Tp.</i>								11	
Washington.....	<i>Tp.</i>		1							
DELAWARE COUNTY—										
Delaware.....				2			9			
Ashley.....	<i>Vil.</i>	1	1			3				
Brown.....	<i>Tp.</i>						1			
Concord.....	<i>Tp.</i>		1							

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
DELAWARE COUNTY—Concluded										
Delaware	Tp.						1			
Liberty	Tp.						1			
Porter	Tp.		1							
Scioto	Tp.		2							
ERIE COUNTY—										
Sandusky		4	2	4						
Vermillion	Vil.				3					
Berlin	Tp.				2	1		1		
Perkins	Tp.		1							
FAIRFIELD COUNTY—										
Lancaster				14						
Bremen	Vil.			1	3					
Amanda	Tp.		1	1						
Berne	Tp.						1			
Hocking	Tp.		1	10						
Liberty	Tp.			1						
Rush Creek	Tp.		1							
Walnut	Tp.						4			1
FAYETTE COUNTY—										
Washington C. H.			1				2			1
Jefferson	Tp.		1							
Madison	Tp.				1					
Marion	Tp.						1			
Union	Tp.			1						
Wayne	Tp.				3					
FRANKLIN COUNTY—										
Columbus		16	38	236	1		38	35		
Bexley	Vil.			1						
Westerville	Vil.		1		3					
Clinton	Tp.			1						
Franklin	Tp.			1						
Hamilton	Tp.						1			
Jackson	Tp.		1	1						
Mifflin	Tp.	1		1			4			
Norwich	Tp.		1	4						
Pleasant	Tp.						1			
Sharon	Tp.		1							
FULTON COUNTY—										
Lyons	Vil.		1							
Chesterfield	Tp.						1			
GALLIA COUNTY—										
Gallipolis				1						
Addison	Tp.			4						
Cheshire	Tp.			1			1			
Perry	Tp.	2								
Raccoon	Tp.	1								
Springfield	Tp.		1				3			
GEAUGA COUNTY—										
Chardon	Vil.			1	3					
Middlefield	Vil.								1	
Chester	Tp.						1	1		
GREENE COUNTY—										
Xenia							4			
Clifton	Vil.							2		
Caesar Creek	Tp.	1		18	3			7		
Jefferson	Tp.			6						
Miami	Tp.							1		
Spring Valley	Tp.			1						
GUERNSEY COUNTY—										
Cambridge		1		1				5		
Byesville	Vil.	1	1	1						
Fairview	Vil.		1							
Pleasant City	Vil.						1			

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
GUERNSEY COUNTY—Concluded.										
Senecaville	Vil.		1							
Cambridge	Tp.			1			5			
Center	Tp.							7		
Jackson	Tp.			1			1			
Richland	Tp.		1							
Valley	Tp.		5	1					3	
Wills	Tp.		2							
HAMILTON COUNTY—										
Cincinnati	76		5	116	32	6	25	27	1	3
Norwood	2			3			1	4		
St. Bernard				2						
Cheviot	Vil.			1			1	6		
Cleves	Vil.						2			
Glendale	Vil.		1							
Lockland	Vil.			1		1	1			
Mt. Healthy	Vil.			1						
Reading	Vil.	8	1	4		1	4	1		
Silverton	Vil.			1						
Crosby	Tp.				8					
Delhi	Tp.	1								
Miami	Tp.						2			
Whitewater	Tp.			2	1					
HANCOCK COUNTY—										
Findlay			3	2		1	15	4	1	
Arlington	Vil.						2			
Biglick	Tp.		1							
Jackson	Tp.						1			
Marion	Tp.						2			
Pleasant	Tp.	1								
Portage	Tp.						1			
HARDIN COUNTY—										
Kenton				4						
Alger	Vil.		2							
Dunkirk	Vil.	1	1							
McGuffey	Vil.			1						
Mt. Victory	Vil.						7			
Ridgeway	Vil.		3							
Liberty	Tp.				10					
McDonald	Tp.		1	5						
Roundhead	Tp.		1							
HARRISON COUNTY—										
Cadiz	Vil.		2							
Harrisville	Vil.						1			
Hopedale	Vil.		1							
Cadiz	Tp.				2			1		
Green	Tp.		3							
HENRY COUNTY—										
Holgate	Vil.	1		2						
Damascus	Tp.		1							
Harrison	Tp.	1								
Marion	Tp.							4		
Pleasant	Tp.		1							
Washington	Tp.						4			
HIGHLAND COUNTY—										
Leesburg	Vil.				1					3
Brush Creek	Tp.						1			
Concord	Tp.						2			
Hamer	Tp.						1			
Jackson	Tp.						2			
Marshall	Tp.		1		2					
Paint	Tp.		1							

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
HOCKING COUNTY—										
Benton	Tp.		2	7						
Good Hope	Tp.			4			1			
Salt Creek	Tp.	1								
Starr	Tp.		2							
Ward	Tp.			3						
HOLMES COUNTY—										
Hardy	Tp.		1	1						
Washington	Tp.					1				
HURON COUNTY—										
Bellevue		1						2		
Norwalk		1				1				1
Greenwich	Vil.									
New Haven	Tp.									
Richmond	Tp.	1								
JACKSON COUNTY—										
Wellston			2	10						
Coal	Tp.		1	1						
Jefferson	Tp.			1						
Milton	Tp.			2						
JEFFERSON COUNTY—										
Steubenville		2	1	3	12		5			
Bergholz	Vil.						3			
Empire	Vil.	1		4						
Mingo Junction	Vil.			3			1			
Mt. Pleasant	Vil.						1			
Tiltonville	Vil.			1						
Toronto	Vil.		1	1						
Cross Creek	Tp.			1						
Knox	Tp.					1				
Salem	Tp.		1							
Saline	Tp.			3						
Wayne	Tp.			4						
Wells	Tp.				5					
KNOX COUNTY—										
Mt. Vernon			3				27			
Centerburg	Vil.						2			
Clinton	Tp.						3			
Hillias	Tp.						2			
Jackson	Tp.		3							
LAKE COUNTY—										
Painesville	Tp.			1						
LAWRENCE COUNTY—										
Chesapeake	Vil.		1	6			6			
Coal Grove	Vil.			1						
Hanging Rock	Vil.		2							
Proctorsville	Vil.						2			
South Point	Vil.			2						
Aid	Tp.	1	1							
Decatur	Tp.			1						
Fayette	Tp.			3						
Mason	Tp.		1					27		
Perry	Tp.		1							
Symmes	Tp.	1		4						
Union	Tp.			6			5			
Upper	Tp.		1							
Windsor	Tp.			2						
LICKING COUNTY—										
Newark		2	5	2			2	1		
St. Louisville	Vil.		2							
Utica	Vil.						3			
Fallsburg	Tp.		1							
Hanover	Tp.		1		9	9				
Lima	Tp.						1			

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
LICKING COUNTY—Concluded.										
Madison	Tp.		2			1				
Mary Ann	Tp.		1				1			
Monroe	Tp.		1							
Newark	Tp.							1		
Newton	Tp.		1							
Washington	Tp.						3			
LOGAN COUNTY—										
Bellefontaine				1	5					
Rushsylvania	Vil.		1							
West Liberty	Vil.					1				
Stokes	Tp.				1					
Zane	Tp.	1								
LORAIN COUNTY—										
Elyria				1	3		4	3		
Lorain	1		3	8	4		5	1		
Amherst	Vil.	2								
Oberlin	Vil.						1		3	
Black River	Tp.						1			
Huntington	Tp.		2							
Pittsfield	Tp.								1	
Ridgeville	Tp.			2					1	
Russia	Tp.								2	
LUCAS COUNTY—										
Toledo	47	3	41	43	41	6	41	8	7	2
Sylvania	Vil.		2							
Adams	Tp.			2						
Providence	Tp.						8			
Washington	Tp.			8	3			6		
MADISON COUNTY—										
London	Vil.		1				3			
Mt. Sterling	Vil.	1								
West Jefferson	Vil.			4						
Deer Creek	Tp.			1			1			
Fairfield	Tp.						1			
Jefferson	Tp.			3			7			
Monroe	Tp.		1							
Paint	Tp.		2							
Pleasant	Tp.		1							
MAHONING COUNTY—										
Youngstown	13	10	6	19	20	35	20	10	25	2
Canfield	Vil.			2						
East Youngstown	Vil.		1	1	2		1			
Lowellville	Vil.		1	1			2			
Struthers	Vil.	3		3				1		
Austintown	Tp.		1					4		
Boardman	Tp.		1	1						
Coitsville	Tp.	1		3						
Ellsworth	Tp.		1							
Green	Tp.	8			3		1			
Poland	Tp.							2		
Springfield	Tp.	2		1		12				
MARION COUNTY—										
Marion			1	3	1		2	1		
Caledonia	Vil.		6							
Morral	Vil.			1						
Claridon	Tp.								1	
Pleasant	Tp.						1			
Prospect	Tp.							2		
MEDINA COUNTY—										
Medina	Vil.						1			
Brunswick	Tp.	1					2		1	
Lafayette	Tp.		1							
Liverpool	Tp.						3			

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MEIGS COUNTY—										
Middleport	Vu.			1			2			
Chester	Tp.			2						
Lebanon	Tp.			11						
Orange	Tp.	1	1					3		
Sutton	Tp.						16			
MERCER COUNTY—										
Celina	Vu.		9	1						
Coldwater	Vu.		2							
Butler	Tp.		1							
Recovery	Tp.						11			
Washington	Tp.		1							
MIAMI COUNTY—										
Piqua		1	1	3				1		
Troy				1						
Laura	Vu.		1							
West Milton	Vu.		1				7			
Bethel	Tp.							8		
Brown	Tp.				2					
Newberry	Tp.						1			
Staunton	Tp.			1						
Union	Tp.		2	1			6			
MONROE COUNTY—										
Woodsfield	Vu.		2	1						
Green	Tp.	1						1		
Summit	Tp.		1							
MONTGOMERY COUNTY—										
Dayton		18	3	14	48	15	2	32	5	
Brookville	Vu.							1		
Farmersville	Vu.							1		
Miamisburg	Vu.			6						
Phillipsburg	Vu.							1		
West Carrollton	Vu.							1		
Butler	Tp.			1						
German	Tp.		4				1	3		
Jackson	Tp.						5			
Madison	Tp.		1				4			
Mad River	Tp.			1						
Perry	Tp.	2								
MORGAN COUNTY—										
Deavertown	Vu.			1			2			
Center	Tp.		2							
Deerfield	Tp.			2	6			5		
Meigsville	Tp.			13						
Penn	Tp.	1								
York	Tp.			1						
MORROW COUNTY—										
Marengo	Vu.							2		
Mt. Gilead	Vu.		1	1						
Bennington	Tp.							2		
Congress	Tp.							1		
Gilead	Tp.			1						
Harmony	Tp.			1						
Lincoln	Tp.		1				4			
South Bloomfield	Tp.		1							
MUSKINGUM COUNTY—										
Zanesville		1		2	5	1	3	2		
Fazeysburg	Vu.	1						1		
Brush Creek	Tp.				2					
Falls	Tp.			2						
Hopewell	Tp.		1				6			
Meigs	Tp.	1								
Newton	Tp.		1		2	1				
Perry	Tp.						1			

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MUSKINGUM COUNTY—Concluded.										
Rich Hill	Tp.		1							
Springfield	Tp.		1							
Wayne	Tp.				19					
NOBLE COUNTY—										
Belle Valley	Vu.		1							
Caldwell	Vu.				1		8			
Brookfield	Tp.								1	
Buffalo	Tp.								4	
Center	Tp.				3					
Noble	Tp.	1							11	
Sharon	Tp.				15					
OTTAWA COUNTY—										
Port Clinton	Vu.		1							
Benton	Tp.		1							
Danbury	Tp.									7
PAULDING COUNTY—										
Paulding	Vu.		8	3						
Emerald	Tp.		1							
Latty	Tp.			1						
Paulding	Tp.		1							
PERRY COUNTY—										
New Straitsville	Vu.			3			1			
Rendville	Vu.		3							
Santoy	Vu.	1		1						
Bearfield	Tp.			6						
Hopewell	Tp.						2			
Madison	Tp.						1			
Monroe			2	1						
PICKAWAY COUNTY—										
Circleville				2						
Ashville	Vu.		1							
Darby	Tp.		1							
Harrison	Tp.		1							
Jackson	Tp.			4						
Scioto	Tp.		4							
PIKE COUNTY—										
Camp Creek	Tp.						1			
Jackson	Tp.		4							
Sunfish	Tp.		1	1						
PORTAGE COUNTY—										
Kent	Vu.						1			
Brimfield	Tp.		3							
Charlestown	Tp.		7							
Franklin	Tp.						1			
Palmyra	Tp.						3			
Randolph	Tp.	2								
Suffield	Tp.		3							
PREFBLE COUNTY—										
Eaton	Vu.			1						
West Alexandria	Vu.			1						
Gaspar	Tp.		1	1						
Harrison	Tp.		2							
Somers	Tp.		1	1					64	
Twin	Tp.		1							
PUTNAM COUNTY—										
Belmore	Vu.		5							
Columbus Grove	Vu.		1	1						
Gilboa	Vu.						1			
Ottawa	Vu.			1			1			
Pandora	Vu.		2							
Blanchard	Tp.						1			
Pleasant	Tp.		1							
Riley	Tp.	1								

COMMUNICABLE DISEASES, OCTOBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
RICHLAND COUNTY—										
Mansfield	1		1	2	2	2	1	4		11
Lexington	Vil.		1							
Shiloh	Vil.		1							
Franklin	Tp.		1							
Jackson	Tp.					1				
Madison	Tp.	1	1		8		4			1
Washington	Tp.			1						
ROSS COUNTY—										
Chillicothe	1		3	6			2	1		
Adelphi	Vil.		1							
Buckskin	Tp.			1						
Green	Tp.			3						
Jefferson	Tp.			1						
Liberty	Tp.		3	1						
Paint	Tp.		1							
Scioto	Tp.		2							
Twin	Tp.			6						
SANDUSKY COUNTY—										
Fremont	1		1				3	1		
Clyde	Vil.		3							
Woodville	Vil.		1							
Sandusky	Tp.						1			
SCIOTO COUNTY—										
Portsmouth	3			23			22			
New Boston	Vil.		1	4	4		3			
Clay	Tp.		2	3						
Green	Tp.									
Madison	Tp.						1			
Nile	Tp.			5						
Porter	Tp.		2	1						
Rarden	Tp.		5							
Union	Tp.		1	1						
Washington	Tp.			8						
SENECA COUNTY—										
Fostoria			1	1			1			
Tiffin			1	1		2		1		
Adams	Tp.		1							
Bloom	Tp.	1	1							
Hopewell	Tp.		1							
Liberty	Tp.		2							
Seneca	Tp.		1							
SHILBY COUNTY—										
Anna	Vil.						1			
Clinton	Tp.							2		
STARK COUNTY—										
Alliance	5	3	1				5	1		
Canton	2	2	7	13		3	26	5		
Massillon			1	8						
Brewster	Vil.		3							
Minerva							1			
Canton	Tp.	1								1
Lake	Tp.			1			1			
Lexington	Tp.	1						1		
Paris	Tp.		1					2		
Plain	Tp.		1				3			
Sugar Creek	Tp.		4							
Tuscarawas	Tp.		2							
SUMMIT COUNTY—										
Akron	3		21	8		1	15	1		
Barberton				8			5			
Cuyahoga Falls	Vil.		1	2						
Kenmore	Vil.			2		1	2			
Macedonia	Vil.						1			

COMMUNICABLE DISEASES, OCTOBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
SUMMIT COUNTY—Concluded.										
Mogadore	Vil.						1			
Coventry	Tp.		1	1						
Hudson	Tp.					2				
Norton	Tp.			1						
Portage	Tp.						4			
Springfield	Tp.						1			
Stowe	Tp.						3			
Tallmadge	Tp.						1	1		
Twinsburg	Tp.					2				
TRUMBULL COUNTY—										
Niles			4	11						
Warren		2	5	6		13	1			
Newton Falls	Vil.						1			
Brookfield	Tp.		1	3			6			
Fowler	Tp.									6
Gustavus	Tp.		1							
Hartford	Tp.		1							
Howland	Tp.			2						
Hubbard	Tp.	2	1	1			2		1	
Johnston	Tp.						1			
Kinsman	Tp.							10		
Mecca	Tp.		2							
Mesopotamia	Tp.			1						
Newton	Tp.		2				3	1		
Southington	Tp.		2		3					
Warren	Tp.			1						
Weathersfield	Tp.		1							
TUSCARAWAS COUNTY—										
Canal Dover			5	4		1	4			
New Philadelphia		1		4			8			
Bolivar	Vil.		1							
Dennison	Vil.		1	4	2					
Newcomerstown	Vil.						4			
Strasburg	Vil.			4						
Uhrichsville	Vil.		1	2			5			
Dover	Tp.						4			
Franklin	Tp.		1	4						
Goshen	Tp.			2						
Jefferson	Tp.	1								
Lawrence	Tp.			1						
Mill	Tp.			2			1			
Salem	Tp.						1			
Sandy	Tp.		3							
Union	Tp.		1							
UNION COUNTY—										
Unionville Center	Vil.							1		
Allen	Tp.		2							
Marysville	Vil.		1				2	5		
Claibourne	Tp.		1				1			
Jackson	Tp.				1					
Leesburg	Tp.						2			
Paris	Tp.						2			
VAN WERT COUNTY—										
Van Wert				1						
Ohio City	Vil.					1				
Scott	Vil.									1
Jennings	Tp.		1							
Union	Tp.			1			1			2
VINTON COUNTY—										
McArthur	Vil.			7						
Brown	Tp.			1						
Elk	Tp.			14						
Knox	Tp.		1							

COMMUNICABLE DISEASES, OCTOBER, 1915—Concluded.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of October, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
VINTON COUNTY—Concluded.										
Richland	Tp.			1						
Swan	Tp.			2						
Vinton	Tp.		1							
WARREN COUNTY—										
Marneville	Vil.		2							
Hamilton	Tp.						1			
Washington	Tp.					4	2			
Wayne	Tp.						1			
WASHINGTON COUNTY—										
Marietta		1	1				3	1		
Belpre	Vil.			2						
New Matamoras	Vil.	1	2							
Dunham	Tp.							1		
Grandview	Tp.						1			
Marietta	Tp.		6							
Muskingum	Tp.		1					2		
Warren	Tp.		4							
Wesley	Tp.		2							
WAYNE COUNTY—										
Doylestown	Vil.			1						
Orrville	Vil.			1						
Rittman	Vil.						5			
Baughman	Tp.			1						
Chippewa	Tp.		2							
Milton	Tp.			3						
Sugar Creek	Tp.	1								
Wayne	Tp.		1							
WILLIAMS COUNTY—										
Bryan	Vil.		1				1			
Stryker	Vil.		1							
Center	Tp.	1								
Florence	Tp.		1					7		
WOOD COUNTY—										
Bowling Green			5			1				
Cygnets	Vil.		4							
Grand Rapids	Vil.	1								
Hoytsville	Vil.		1							
Milton Center	Vil.							3		
Pemberville	Vil.			1						
Perrysburg	Vil.	1	2				1			
Prairie Depot	Vil.		2							
Tontogany	Vil.							1		
Freedom	Tp.			1						
Henry	Tp.						4			
Jackson	Tp.			1						
Middleton	Tp.							1		
Montgomery	Tp.		1							
Perrysburg	Tp.						1			
Plain	Tp.				2		1			
Portage	Tp.			1						
Ross	Tp.	1	1		2					
Weston	Tp.			1						
WYANDOT COUNTY—										
Wharton	Vil.		1							
Marseilles	Tp.		1							
Ridge	Tp.			3						
Tymochtee	Tp.		1							

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, OCTOBER, 1915.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Cerebro-Epidemic Spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
ADAMS COUNTY—								
Green	<i>Tp.</i>	3						
ALLEN COUNTY—								
Delphos		2						
Lima		3						
ASHLAND COUNTY—		1	1				1	
ASHTABULA COUNTY—								
Conneaut					1			
ATHENS COUNTY—								
Athens		2						
Buchtel	<i>Vil.</i>	1		1				
Coolville	<i>Vil.</i>	1						
Rome	<i>Tp.</i>				1			
AUGLAIZE COUNTY—								
New Knoxville	<i>Vil.</i>	1						
BELMONT COUNTY—								
Bellaire		4		1				
Pultney	<i>Tp.</i>	1						
BROWN COUNTY—								
Ripley	<i>Vil.</i>	1						
Union	<i>Tp.</i>	1						
BUTLER COUNTY—								
Hamilton		11	5	1		2	1	
Middletown		3	1			1	6	a 2
CHAMPAIGN COUNTY—								
Urbana							1	
CLARK COUNTY—								
Springfield			1	1	1	1	1	
CLERMONT COUNTY—								
Williamsburg	<i>Vil.</i>	2						
Jackson	<i>Tp.</i>					1		
CLINTON COUNTY—								
Wilmington	<i>Vil.</i>	1						
COLUMBIANA COUNTY—								
East Liverpool		3						
East Palestine	<i>Vil.</i>		1					
COSHOCTON COUNTY—								
Bedford	<i>Tp.</i>	1						
CUYAHOGA COUNTY—								
Cleveland			5	7	25	59	18	a 6 b 1
Lakewood							1	
DARKE COUNTY—								
Greenville			1			1		
DELAWARE COUNTY—								
Delaware	<i>Tp.</i>	1						
Scioto	<i>Tp.</i>			1				
ERIE COUNTY—								
Sandusky		2			1			
Groton	<i>Tp.</i>				1			
FAIRFIELD COUNTY—								
Lancaster		2						
Carroll	<i>Vil.</i>	2						
Greenfield	<i>Tp.</i>	2						
FAYETTE COUNTY—								
Bloomingsburg	<i>Vil.</i>	1						
Jefferson	<i>Tp.</i>	1						
Paint	<i>Tp.</i>	1						
FRANKLIN COUNTY—								
Columbus		1	1			1	1	
Hilliards	<i>Vil.</i>	1		1				
Westerville	<i>Vil.</i>					1		

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, OCTOBER, 1915 — Continued.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-Spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
FULTON COUNTY—								
Amboy .....Tp.	1							
GALLIA COUNTY—								
Cheshire .....Tp.								c 1
Raccoon .....Tp.	1							
GEAUGA COUNTY—								
Troy .....Tp.						1		
GREENE COUNTY—								
Jefferson .....Tp.	1							
HAMILTON COUNTY—								
Cincinnati .....Tp.	12	14	2		1	1	6	d 1 e 2
Addyston .....Vil.	2	1						
HANCOCK COUNTY—								
Findlay .....Tp.							1	
HARDIN COUNTY—								
Liberty .....Tp.	1							
Roundhead .....Tp.	4							
HARRISON COUNTY—								
New Athens .....Vil.	1							
HENRY COUNTY—								
Hamler .....Vil.				1				
Damascus .....Tp.	1					1		
HIGHLAND COUNTY—								
Paint .....Tp.	1							
HOCKING COUNTY—								
Ward .....Tp.	1							
HOLMES COUNTY—								
Walnut Creek .....Tp.					1			
HURON COUNTY—								
New London .....Vil.					2			
JEFFERSON COUNTY—								
Cross Creek .....Tp.	1		1					
Ross .....Tp.				1				
KNOX COUNTY—								
Mt. Vernon .....Vil.	1				1			
Fredericktown .....Tp.	1							
LICKING COUNTY—								
Hanover .....Tp.	4							
Hartford .....Tp.	5							
LOGAN COUNTY—								
Bellefontaine .....Tp.		2						
Monroe .....Tp.					1			
LORAIN COUNTY—								
Elyria .....Tp.	4		1		4	1	1	
Lorain .....Tp.							1	
LUCAS COUNTY—								
Toledo .....Tp.	37	27				3	2	e 1
Maumee .....Vil.	1							
MADISON COUNTY—								
London .....Vil.	2							
MAHONING COUNTY—								
Youngstown .....Tp.	11	1	1		1	3		
Canfield .....Vil.		1						
East Youngstown .....Vil.	1				1	1	2	
Poland .....Vil.	1							
Struthers .....Vil.		1					3	
Canfield .....Tp.								
Green .....Tp.	2							
MEDINA COUNTY—								
Wadsworth .....Tp.				1	1			
York .....Tp.				1	1			

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, OCTOBER, 1915 — Continued.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-Spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
MEIGS COUNTY—								
Chester	<i>Tp.</i>						1	
Sutton	<i>Tp.</i>	1						
MERCER COUNTY—								
Union	<i>Tp.</i>	1						
MIAMI COUNTY—								
Brown	<i>Tp.</i>					1		
Spring Creek	<i>Tp.</i>					1		
MONTGOMERY COUNTY—								
Dayton	10	8		1	1	1	14	f 1
German	<i>Tp.</i>	1						
Jefferson	<i>Tp.</i>	1						
Madison	<i>Tp.</i>			1				
Wayne	<i>Tp.</i>	2						
MORROW COUNTY—								
Franklin	<i>Tp.</i>	2						
MUSKINGUM COUNTY—								
Fazeysburg	<i>Vil.</i>	1						
Meigs	<i>Tp.</i>	2						
NOBLE COUNTY—								
Olive	<i>Tp.</i>				2			
OTTAWA COUNTY—								
Port Clinton	<i>Vil.</i>	1						
PERRY COUNTY—								
Monroe	<i>Tp.</i>			1				
PICKAWAY COUNTY—								
Darbyville	<i>Vil.</i>	2						
Darby	<i>Tp.</i>					1		
Pickaway	<i>Tp.</i>	1						
PIKE COUNTY—								
Newton	<i>Tp.</i>				1			
PORTAGE COUNTY—								
Edinburg	<i>Tp.</i>				1			
Randolph	<i>Tp.</i>	1						
RICHLAND COUNTY—								
Jefferson	<i>Tp.</i>				1			
ROSS COUNTY—								
Chillicothe	2	1				1		
SANDUSKY COUNTY—								
Fremont	1							
SCIOTO COUNTY—								
Portsmouth							5	
New Boston	<i>Vil.</i>	11	2					
SENCEA COUNTY—								
Tiffin					1		1	
Thompson	<i>Tp.</i>				1			
STARK COUNTY—								
Alliance	10	2		1	5			
Canton					3			
Massillon							1	
Canton	<i>Tp.</i>				1			
Lawrence	<i>Tp.</i>				4			
SUMMIT COUNTY—								
Akron					7	8	1	
Kenmore	<i>Vil.</i>				1			
Franklin	<i>Tp.</i>				1			
Norton	<i>Tp.</i>				1			
Portage	<i>Tp.</i>				1			
Tallmadge	<i>Tp.</i>				1			
TUSCARAWAS COUNTY—								
New Philadelphia	1	1						
Wayne	<i>Tp.</i>				1			

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, OCTOBER, 1915 — Concluded.

Health District.	Gonorrhea.	Syphilia.	German Measles.	Epidemic Cerebro-Spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
WARREN COUNTY—								
Hamilton <i>Tp.</i>		1						
WASHINGTON COUNTY—								
Marietta <i>Tp.</i>						1		
Dunham <i>Tp.</i>	2							
WAYNE COUNTY—								
Orrville <i>Vil.</i>					2			
Baughman <i>Tp.</i>	1				2			
East Union <i>Tp.</i>					1			
Salt Creek <i>Tp.</i>	4							
WILLIAMS COUNTY—								
Montpelier <i>Vil.</i>	1							
Center <i>Tp.</i>				1				
WOOD COUNTY—								
Grand Rapids <i>Vil.</i>			1					
Hoytville <i>Vil.</i>	1							
Perrysburg <i>Tp.</i>		1						

a Malaria. b Rabies. c Septic Sore Throat. d Paratyphoid. e Chancroid. f Tetanus.

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The Ohio Public Health Journal

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EDITED BY

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DECEMBER, 1915.

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THE DEVELOPMENT OF STATE PUBLIC HEALTH NURSING.*

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There is no subject which I would rather discuss than the "Development of State Public Health Nursing", and no city in the state where I would rather discuss it than in Cleveland. My reason is that from the very outset of the state work, I have kept before me either consciously or unconsciously the ideals and methods which you have worked out here in Cleveland.

Imperfect and unsatisfactory as the state work now is, nevertheless I believe we are slowly strengthening our lines in every direction, so that in a few years the State of Ohio will have a public health nursing service that will measure up to the standards, not only of personnel but of results, which you have in Cleveland. In other words, Cleveland standards are to become those for the State of Ohio, insofar as its public health nursing service is concerned. So if the service accomplishes all that we believe it will, then we are to be congratulated for having the good sense to know an intelligent, well co-ordinated plan when we see it. If it should fail, then it will become our painful duty to discover an alibi as soon as it is possible.

Each day it is becoming clearer to health authorities that the public health nurse presents the key to practically every one of his so-called problems in preventive medicine and hygiene. And that the medical profession is not yet fully cognizant of the entire situation may be instanced by the fact that in Dr. Rosenau's "Preventive Medicine and Hygiene", a volume of 1,074 pages, published in 1913, not one word is said about the public health nurse, although there is much about vital statistics, legislation, board of health laboratories, milk and meat inspectors, dispensaries and hospitals.

Contrast to this a recent book entitled a "Manual for Health Officers", published in April 1915, by MacNutt, who is not a physician, but a lay health officer. He says, "A comparatively new member of the modern board of health staff is the public health nurse.

* Paper read before Annual Meeting of the Anti-Tuberculosis League, Cleveland, Ohio, 1915.

In the work of the public health nurse the health authorities extend their activity beyond the region of strictly public hygiene into that of personal hygiene".

Our greatest difficulty has been to make the medical men of the state see that the public health nurse differs radically from the institutional or private nurse, with whom he is familiar, and that the type of service which she is to render the community is not remedial but preventive.

EXTENT OF THE STATE PUBLIC HEALTH PROBLEM.

In order to make our state problem clear to you, it becomes necessary to bore you with some figures.

In 1910 the population of Ohio was given by the U. S. Census Bureau as 4,767,121. This population covers a territory of 40,740 square miles divided into 88 counties. The population of these counties ranges from 13,096 in Vinton County to 637,425 in Cuyahoga County.

In 1910 Ohio had 82 cities. A city in Ohio is a municipality having 5,000 or more inhabitants. The aggregate population of these 82 cities was 2,467,054, or 51.8 per cent. of the total population of the state. From these figures it is readily seen that the public health nursing problem of the state is equally urban and rural.

Now, what is happening to this population. The average number of deaths in the six-year period from 1909 to 1914 was 64,423, with an average yearly rate of 13.3 per 1,000. The average rate for the registration area of the United States in the same period was 14.3 per 1,000.

The preventable diseases that help to make up this average total of 64,423 per year are tuberculosis, 6,833; pneumonia, acute, 2,985; typhoid fever, 1,113; diphtheria and croup, 807; whooping cough, 484; measles, 446; scarlet fever, 315; and smallpox, 8.

The records of morbidity in the state are unfortunately not available. If we had them, we could make the picture much more interesting and complete.

PRESENT PUBLIC HEALTH MACHINERY.

At the present time we can say that the health machinery of the state consists in private physicians, nurses, midwives, dispensaries, hospitals, health boards and officers, and their employees, and private voluntary organizations engaged in working on some phase of the public health problem.

There were in 1914, 7,912 physicians in Ohio, according to the American Medical Directory. No one knows how many nurses, midwives, dispensaries, or hospitals, there are. We are just about to issue a social service directory of the state, which we hope will be a step in the direction of knowing the resources of the state in this field.

There are 2,150 health districts in the state, with which we have to deal daily. The first-class health departments in the state can be counted upon your fingers. Practically all the health districts are officered by men poorly paid, with no training for the duties of their office and with but little incentive to endeavor to make themselves even a little proficient in their work. When we view this machine we cannot help but recall the description of the giant of fairy tale days and picture him with a perpetual paralysis. The machine is cumbersome, eats up a tremendous amount of fuel (money), and there exists no oil (law) to make it run smoothly.

The health legislation of the state is founded upon the theory that health questions are first individual between patient and physician and last that the health officer is a local authority created to abate nuisances. Since the early ideas were incorporated in the law, new ideas have gradually crept in and today the health legislation presents a sad spectacle of incongruity, that will never be corrected until the flimsy wooden structure is demolished and a new concrete-steel health code is adopted to meet present day conditions and knowledge.

Now, what bearing has all of this upon the "Development of State Public Health Nursing"? Simply this, we are endeavoring to keep the old machine going by giving it a new motor and we believe that new motor to be the public health nurse. We have been doing this in Ohio with little or no legislation and the time is now here, when the people of the state will have to enact laws that will give security to the principles of the work and give authority for the expenditure of money.

Under present laws public health nurses may be employed and paid for out of public funds, by boards of education in cities; by county commissioners in those counties in which no tuberculosis hospital provision has been made; and by medical superintendents of county and district tuberculosis hospitals. One of the anomalies of our situation is that it has been recently held by the attorney-general that council in any city or other subdivision of the state, not operating under a home-rule charter, has no legal authority to appropriate money to a board of health for the employment of a public health nurse; nor has a board of health any legal authority to employ such a nurse.

THE PUBLIC HEALTH NURSING SERVICE.

The initiation of a state system of public health nursing dates from the work which the Ohio Society for the Prevention of Tuberculosis inaugurated in 1911. In that year a contest was conducted during the Red Cross Seal Campaign which was designed to stimulate the employment of local nurses. The plan was to select some thirty cities of approximately equal population, in which no public health work was being done. These cities agreed to return to the State Society the entire proceeds of their sale and the State Society agreed to send an experienced public health nurse for one month to each of the twelve cities making the highest per capita sales of seals. Since 1911 there have been four such contests. Thirty-two different cities have been visited by the State Traveling Nurse. The results have been that public health leagues have been organized in twenty-eight of the cities, and public health nurses permanently employed in eighteen of the cities.

With the organization of the Division of Tuberculosis in the State Department of Health in May 1913, provision was made for the position of State Supervising Nurse. The public health nursing staff of the State Department of Health consists of a State Supervising Nurse in charge of the entire development of the nursing work of the state. Under her are three nurses; one employed as an educational agent in connection with the Ohio State Public Health Exhibit; one employed to work out the family problems connected with the admissions and discharges to and from the Ohio State Sanatorium, the county, district and private tuberculosis hospitals; one to carry out the provisions of House Bill No. 470, relating to the prevention of blindness. The direction of the work of the State Traveling Nurse employed by the Ohio Society has also been delegated by mutual agreement to the State Supervising Nurse.

At the present time, the public health nursing service in the state consists of:

- 40 nurses employed wholly by voluntary organizations in 23 cities with a combined population of 397,408.
- 63 nurses employed partly by voluntary organizations and boards of education in 8 cities with a combined population of 678,734.
- 184 nurses employed partly by voluntary organizations, boards of health and boards of education in 4 cities with a combined population of 864,003
- 4 nurses employed wholly by boards of education in 4 cities with a combined population of 74,553.
- 2 nurses employed wholly by a board of health in 2 cities with a combined population of 66,910.

4 nurses employed for county work by the county commissioners of 4 counties with a combined population of 209,325.

4 nurses employed for county work by county voluntary organizations in 3 counties with a combined population of 149,524.

1 nurse employed for county work by the county commissioners and county voluntary organization in a county with a population of 57,035.

In this tabulation there is no repetition in cities or counties nor in nurses: e. g. Cleveland is listed as employing 131 plus nurses employed by voluntary organizations, board of health and board of education.

There are then 303 nurses employed in 41 cities and 8 counties of the state with a combined population of 2,454,591.

As has already been stated the present public health nursing service of the state is an outgrowth of the tuberculosis work of the Ohio Society and it is perhaps natural that emphasis should be placed upon the tuberculosis problem in planning for the future development of the service.

Consequently, the hospital provision for tuberculous patients has interest for us not only because of the institutions themselves, but also because of the uses to which they can be put in developing the public health nursing service. The hospital situation is as follows:

Ohio State Sanatorium, Mt. Vernon.

Incipient Pulmonary Tuberculosis for entire state.

Capacity — 165.

*Municipal Sanatoria. Population 1,098,157. **

Cleveland — County population 637,425

with a total bed capacity of 360, divided as follows

Warrensville	220
City Hospital	100
Tent Colony	30
Rainbow Cottage	10

Cincinnati — County population 460,732.

Branch	350
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County Hospitals — Population 484,566.

Butler, Hamilton — County population 70,271.

Capacity — 25.

Franklin, Columbus — County population 221,567.

Capacity — 120.

Lucas, Toledo — County population 192,728.

Capacity — 100.

*District Hospitals — Population 953,479.**Dayton, Two Counties — Population 187,597.*

Montgomery	163,763
Preble	23,834

Capacity — 27.

Lima, Five Counties — Population 169,144.

Allen	56,580
Auglaize	31,246
Mercer	27,536
Shelby	24,663
Van Wert	29,119

Capacity — 60.

Springfield, Four Counties — Population 142,421.

Champaign	26,351
Clark	66,435
Green	29,733
Madison	19,902

Capacity — 50.

Springfield Lake, Five Counties — Population 454,317.

Columbiana	76,619
Mahoning	116,151
Portage	30,307
Stark	122,987
Summit	108,253

Capacity — 120.

*Semi-Public and Private Sanatoria.**Rocky Glen Home — McConnellsville.*

Capacity — 40.

St. Anthony's Hospital — Columbus.

Capacity — 23.

Rockhill Sanatorium — Cincinnati.

Capacity — 9.

Cedar Point Sanatorium — Cincinnati.

Capacity — 15.

Excluding the semi-public and private institutions, it will be seen that Ohio has hospital beds at the present time for 1,387 patients in 21 counties, representing a population of 2,536,202, or more than half the population of the state. If we include the semi-public and private sanatoria, the total number of beds available in Ohio for tuberculous patients is 1,474.

If these figures are compared to those given in connection with the public health nursing service, it is seen that in both fields of activity we have developed our resources approximately fifty per cent. In other words, we are but half through our task of providing equipment to carry on the preventive work.

I fear I have wearied you with too many figures, but it seemed impossible to avoid giving them because of their bearing upon our present plans.

The first plan we have seeks to provide a source of supply of trained public health nurses. We hope to provide this by the establishment of a course in Public Health Nursing under the auspices of the Ohio State University. At the outset, this course will be a post-graduate one for nurses completing a regular three-year hospital training, who desire to enter the public health field. It will include a combination of the theory of social service and practical field work, with social service organizations. The direction of the work, it is hoped, will be under a public health nurse, who has had practical experience in the work itself and in teaching.

The second plan contemplates the local employment of public health nurses in every city of 5,000 population in the state, and in every county until the service can reach every home in Ohio, where such nurses are needed.

The third plan has for its purpose increasing the compensation of these nurses to a mean of \$1,200 per year. At present the minimum standard is \$75.00 per month. However, several cities are offering \$100 per month upon the initiation of the work, and we hope to gradually induce all of the cities to reach and maintain that figure as a minimum.

Summary.

Our public health nursing problem differs from yours in Cleveland only in extent of the territory to be covered. A public health nurse in a city of 5,000 is forced to handle every conceivable problem, not only health but social. It would be impossible, nor would it be desirable, to provide a specialized nursing force for these small cities, but the state can provide a sufficient staff of supervisory nurses to aid the local nurses in meeting special problems as they come up from time to time.

Conclusion.

In conclusion, I wish to quote a short statement submitted to us on October 25, 1915, by Mr. Louis I. Dublin, Statistician for the Metropolitan Life Insurance Company. He discusses the mortality of the industrial population of Ohio in the light of the Metropolitan Life Insurance Company's experience and concludes as follows:

"The foregoing experience of the Metropolitan Life Insurance Company in the State of Ohio is a matter of great interest to the Ex-

ecutives of the Company as they have in recent years inaugurated a campaign of education against the preventable diseases and have instituted a system of visiting nursing of sick policy-holders. It has been demonstrated that this applied preventive work, in conjunction with the great efforts of the general community, has resulted in lowering the death rate in the Industrial Department both for white and colored lives. In the experience of the Company as a whole, the mortality has dropped 7.8% among white lives and 3.8% among colored lives in the last three years. Such results as this give great encouragement to the further extension and development of life conservation work on the part of insurance companies."

Could a stronger argument be advanced for the Development of State Public Health Nursing Service? It does not seem so to me, at least, and I am sure you agree with me.

WHAT MAY BE DONE DURING THE FALL AND WINTER TO PROMOTE CHILD HYGIENE.

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The phrase "Baby Saving Campaign" or "Campaign for Better Babies" has come to be the commonest term used in connection with child hygiene work throughout all the larger communities of the United States, as well as the smaller ones, and it has come to stay. The underlying principle, no matter in what words it may be set forth, has come to stay, because it is rapidly becoming an acknowledged and familiar fact in every intelligent community that there is no use expending money and effort to build beautiful cities, establish school systems and kindred community benefits as long as the children are dying in too large numbers. Why build beautiful cities if there is not to be an ever increasing number of individuals to enjoy their benefits, is an increasingly serious thought. The establishment of a Federal Children's Bureau by an act of Congress in April 1912 and its authorization for the expenditure of Federal money to assist in "all matters pertaining to the welfare of children and child life" was a tribute upon the part of the nation to the importance, indeed the necessity, of work of this kind. Following this step, great numbers of organizations, large and small, have sprung up to attempt to handle the problem in their special city or town. It is hardly neces-

sary to add in this connection that the pioneer work along the lines of the Children's Bureau had been done in certain of our great cities, especially New York, Cleveland, Chicago and Boston, or that Miss Julia Lathrop, the woman appointed as head of the Bureau, had been very closely identified with all child welfare work in the city of Chicago. With the control and improvement of the baby's health there has gone hand in hand that of the child at any age, up to and often through the adolescent period, and for this reason a better and more comprehensive term, although one less frequently used, is that of "child hygiene" or "child welfare work."

One curious fact has developed in connection with this work, namely, that in the cities where not a great deal of effort has been expended, there is often a current belief that the people need concern themselves with these problems only during the summer season. This is probably due to a universal recognition of the seriousness of the intestinal diseases which are especially rife during the summer months. This is far from the correct point of view, however, because during the winter when the season comes on for closed, ill-ventilated and badly heated homes, schools and churches we have the very best opportunity for the development of the respiratory diseases and acute contagions which flourish under just such conditions. The work for the children must, therefore, be not summer work but all the year round work and the local health officer is very vitally involved in the solution or attempted solution of this problem. In assuming the responsibility of becoming health officer for a community a man obligates himself, whether he be physician or layman, to do all within his power to protect the health of that community against invasion by diseases of all sorts; of doing as much as possible not only to raise the standard of living among his people but to maintain that standard at a maximum. In order to do this he must interest himself to his fullest capacity in any movement which may go toward bettering the condition of the people among whom he lives, and there can be no better or more profitable field in which he can work than in that of child hygiene.

It has been reported all over our state during the last month that Ohio's birth rate is 19.6 per one thousand of its population as against 12.94 per one thousand death rate. A very conservative estimate of the economic loss from death to the State would be twenty-five hundred dollars per year per individual; but say we make it this. The population of the State of Ohio at the last estimation on January 1, 1914 was 5,026,898, and on this basis the State of Ohio has lost during the last twelve months in round numbers one hundred and sixty-

eight million dollars. A rough estimate would make at least one-fifth of these deaths occur at under five years of age and one-fourth at under fifteen years of age. This would perhaps be a more sane way to consider the question than to rejoice too much in the increasing birth rate. In the face of an economic waste such as this who can hesitate in assuming his full responsibility toward the conservation of child life?

Probably until the age of the millennium is reached we shall be struggling to obtain proper registration of all births and for this reason the question of the necessity for vital statistics always heads any list of important activities. How many people have died in our community who have never been born! This is too familiar an occurrence to need comment. No health officer is complying with the requirements who does not make full and accurate reports every month as to the births and deaths in the district over which he has jurisdiction. Nor is it only desirable that such registration be made in order that identification may be possible at any period but in all of our most intelligent localities today the prophylactic work for children is begun immediately after birth if not before. In attempting to do this post-natal work one of the greatest aides is a correct and available file of births. No matter how small the community in which work is to be done it may just as well be of the best quality as of the poorest. It is no reflection upon a neighborhood to do a very small amount of work if the workers be few in number but it is always a reflection to do superficial work no matter how great its volume. It would be advisable, first of all, then, in undertaking child hygiene work to do careful work in registering births and deaths because vital statistics are being studied more and more carefully in our cities, and it is always wise to let as many people in a community as possible become familiar with the death rate of that community and the causes of death.

In the school, where the children are during the major part of the time, a great deal of work needs to be done. If there is a fully equipped system of physical supervision in the schools this is an easy matter but in many localities where there is no machinery of this sort a great deal may still be accomplished. Both teachers and pupils will enter into the spirit of the work if the necessary impetus or even the merest encouragement be forthcoming from the health officer or members of the health department. Such simple studies may be made as that of the children's teeth. Unfortunately, lack of cleanliness is the greatest obstacle in many cases and if this can be obviated in the very young children much of the subsequent decay

will also be obviated. Any teacher may train her children in a tooth brush drill, of which there are several types and about which it is easy to learn, and any child can secure a tooth brush for this purpose. Such brushes may be marked, cleansed under the teacher's supervision and kept in the children's desks or hers. This drill permits the child to move about a little and if used at a time during the school session when the children seem tired and restless will often bring a welcome change and thereby serve a double purpose. Further efficient work may be done by an intelligent teacher or school nurse who will inspect the teeth of all her children and note even the glaring defects in the way of decayed teeth and then follow up the cases by notes or conferences with mothers as to the necessity for dental work.

The temperature of the school room is generally too hot or too cold. This may be prevented if a simple thermometer is available and the children may be taught to take readings three or four times a day, one child being selected as health officer for the day or week, and the control of the temperature of the room and its proper ventilation may be his or her special duty.

The necessity for individual towels and drinking cups is so well understood now and they are so generally employed that it is hardly necessary to speak of them nor of the dangerous affections of eyes, nose and throat, etc., which may be avoided by their intelligent use. We say intelligent advisedly because it is not so rare to go into a school in which individual drinking cups may be provided but where no provision is made to cover them and in consequence they serve as dust catchers and are cheerfully walked over by flies if it be the season of open windows and there are no screens. In some schools a single child is chosen each day to distribute drinking water from a large pitcher, from which individual drinking cups kept in the child's own desk are filled.

If the health officer would demand from each group, no matter how small it be, that every child with a severe cough or a sneezing cold be excluded from school until well much would be done in the winter season to prevent the spread of the contagious diseases. If there be no regular medical supervision in the school it will often be possible for the health officer to secure the voluntary services of one or more physicians to give such physical supervision either at school or in their own offices.

If a case of infection be reported in a community in which you live, by a neighbor, physician or nurse do you at once notify the school in order that children of that family may be excluded and so

perhaps a whole room full of children be protected from the spread of infection? If not, as health officer you are partly responsible for other cases which may develop. Should any number of cases develop it is obviously your duty to close all buildings temporarily in which a large number of people may congregate. It must always be borne in mind too that there is still a comparatively large number of people who believe that infants and little children will have to go through a series of infectious diseases and so the sooner they do the better. All physicians have a duty in dispelling this idea among the people of their community.

Much may be done to improve the condition among children by becoming fully conversant with housing conditions under which they live. If houses are damp, insanitary or overcrowded, especially if they are of the so-called tubercular type, i. e., houses in which one or more cases of tuberculosis have been housed without proper fumigation after their removal, what chance have the children who live in them of coming through unhampered if not actually disabled by such an environment?

If there be a child in a city, town or village who exhibits signs of feeble-mindedness or imbecility, every effort should be made upon the part of the health officer to have the condition diagnosed and to see to it that if possible some disposition be made of the child whereby it may receive custodial care and so cease to be a menace to the neighborhood, which it always is if allowed to remain. This applies to a feeble-minded child of any age, whether it be one or thirty years of age physiologically. It is almost always possible now to have expert opinion and examination but it is very essential that it go accompanied by as full and comprehensive a family history for several past generations, as it is possible to obtain, for so very much depends upon this. One feeble-minded family in a community may be the source of inestimable danger.

The matter of children's recreation is the one which perhaps has been best developed for the open months of the year. Nearly all localities in the present day have at least one play ground with outdoor sports under some kind of supervision. Many neighborhoods have model gardens for the children in which work and play are combined but in many there is no recreation for the winter months. Sledding and skating while splendid exercises, may not be available and some substitute must be offered. For organized sports such as basket ball, indoor baseball, the modern rhythmic dancing and calisthenics nothing more is required than a large enough space whether it be barn, school room or gymnasium. In some of the New England

towns barns have been used very successfully for active sports and if not occupied, as often happens, may be rented at a nominal cost. If the school house is large enough what better use can be made of it at least at week-ends, or if more quiet recreation is desired it can be used for boys' and girls' clubs of all sorts.

The above are only a few of the things, each one simple in itself if there is a will to carry it out, which may be done to promote child hygiene during the winter months. There are numerous other more elaborate schemes which may be developed but it has been the object of this paper to suggest only those activities which may be carried out in the smallest village without equipment. Moreover, we are rapidly approaching the point where every community is going to regard its responsibility along these lines as much an integral part of its life as any other of its corporate activities. Nor can the people living in a non-congested country region any longer plead that they have no need to consider these problems because country children are healthier than city children. It has been conclusively proven by careful statistical study that there are today more defects uncorrected in country than in city children; that often nutrition is badly impaired in the rural districts, and that the standard of living especially as relates to morality needs to be raised to quite as great a degree. Another objection which is often raised is that a rural community has no "slum population" and hence no real need exists for active work in hygiene. We need constantly to keep in mind that it is often the well-to-do mother who is most lacking in a reliable knowledge of health problems, and the most important work which we have before us to do is to expend money and energy in maintaining health rather than in maintaining expensive pieces of machinery to control disease.

The Ohio State Board of Health has very recently established a Division of Child Hygiene in order to help as much as lies within their power in Ohio's work for child welfare. The duties of this department shall be to become fully conversant with established activities in the various communities of the State, to formulate a plan whereby the necessities of these towns or villages seeking help along these lines may be relieved as much as possible and to give as much personal assistance in an advisory capacity as time will allow or the individual neighborhood desires. In the task of making this department of real service to the children in the State of Ohio the assistance and the good will of every local health officer is earnestly solicited. The Director will meet the health officers when going into a neighborhood for the study of local conditions and stands ready to do as much as she is capable of doing to assist in the solution of the problems of his individual community.

HOW A HEALTH OFFICER CAN BE MOST USEFUL TO HIS COMMUNITY.

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The village and township health officer has a very important duty to perform in caring for the health and comfort of the people living in his district. Many men are alert to the possibilities which are ever present for them to demonstrate their value, while some only do the things which in reality they are forced to do. Now it is known that the health officer receives little or no remuneration for the work which he does, and at the present time one must expect to make many sacrifices in order to secure the proper results in the care of infectious diseases or the improvement of sanitary conditions.

With conditions as they are, it is many times difficult for the health officer to secure the co-operation so necessary for the success of his work. Many people object to quarantine, do not want to keep their property clean and sanitary and by their objections and resistance, make the work sometimes unpleasant. The Health Officer is called to enforce quarantine, to abate nuisances due to objectionable privies and noxious pigpens, to settle neighborhood quarrels over chickens, manure piles, obstructed alleys, to care for the smaller dead animals, to prevent the dumping of trash on vacant lots or along the highways, and also upon various other errands of greater or lesser importance. It requires a man fearless and determined and yet diplomatic, in order to cope with the various problems with which he is confronted. The work of the Health Officer is very important, and his qualifications are equally so. The difficulties which he encounters are due to a lack of appreciation on the part of a large portion of the people of the value of his work. The natural and logical solution, then, of the health officer's troubles is in education. Thereby he may hope to accomplish results and at the same time obtain a larger competence for his time and labor and his insults.

A health officer under the existing conditions must necessarily be public spirited in order to make the sacrifices so necessary for the success of his work. He must be careful and patient, always doing his duty as best he can, and cannot expect to receive a proper reward for the work which he does. He must continually keep in mind methods by which he can hope to educate the people to a higher plane of living, which will not only make his work more pleasant but at the same time much less in extent.

In the education of the people, it is necessary that the health officer be informed concerning the problems with which he is confronted. The purposes of these conferences is to bring the health officers together and present to them various phases of public health work in order that they may become more familiar with it. A careful study of the health laws is necessary, a proper understanding of the methods of obtaining water supplies and the difficulties and dangers which are to be encountered and avoided in the securing of such supplies is important information for him to possess in order that he may properly advise others. He should know the proper construction for privies and cesspools and the regulations governing their installation, including a knowledge of sanitary plumbing. The field is wide and there are ample opportunities for additional work in caring for the communicable diseases and the statistics connected therewith. What a world of good could be accomplished if the information available concerning tuberculosis could be brought to the attention of the individual citizens. This is but one step in the educational propaganda. In addition to the information which may be disseminated through personal contact, the various City Boards of Health, as well as The State Board of Health, have prepared bulletins and pamphlets on various subjects, along public health lines, for free distribution. The health officer should not fail to take advantage of these publications and distribute them throughout his district. An easy way to accomplish this is in securing the co-operation of the physicians. If he will furnish the physicians with the literature which is provided him by the State Department of Health, I am sure that they will be glad to give it in turn to the residents of the community. The health officer should not depend, however, entirely upon the physicians, but should distribute some himself. By securing the co-operation of the physicians, a great good can be accomplished, because in many instances, the physician needs as much education along public health lines as do the people. At the same time, by coming in close and intimate contact with the members of the medical profession, greater efficiency in quarantine and control of infectious diseases can be secured.

A familiarity with the village or township is a very important matter. How many health officers make inspections only after repeated complaints and insistence upon the part of the people concerned. This should not be necessary. The health officer should visit regularly all portions of his district and become familiar with the kind of wells, whether dug, driven or drilled, their location and the sanitary conditions which surround them. He should also have a

knowledge as to the type and condition of privies, the location of slaughter houses, milk depots, creameries, cheese factories, and should know at all times the sanitary conditions which surround them. A careful study is necessary upon the part of the health officer in order to be familiar with these different phases of his work. He should in reality make a sanitary survey of his district, including in such a survey, all of the points above mentioned as well as facts concerning schools, churches and other public meeting places. Should such a survey be made, with notes properly taken, covering the various points of interest to the student of sanitary conditions, and should these notes be properly prepared and presented to the people, do you not believe that it would be possible to secure a greater co-operation from them?

In connection with sanitary surveys, it is interesting to note some of the peculiar things which have been observed in different parts of the State. In one of the south-eastern Ohio counties, some of the smaller communities were inspected where sanitary conditions are very bad. In one community in particular, the people have no regard whatever for proper living conditions. The school building is old and dilapidated, the boys and girls use the same privy which is not provided with a vault and from which the deposits have not been removed for a long time. The buildings are old and dilapidated, and the privy is so close to the building that during the spring and fall when the windows are open the odor is almost intolerable. The school is not provided with a well but water is carried from a farm well, located nearly a half mile away. The children carry water, bringing a pail about every other day. The pail is left open, a common drinking cup or dipper provided, and what waste water there is, is deposited through a small drain on the surface of the ground directly beneath the building. The school board does not furnish towels. But one towel was found and this was so filthy that at home it would be burned. A stove was provided for heating the building, but was so located that during cold weather the pupils in the distant parts of the room would be cold while those in closer proximity to the stove would be nearly roasted. The paint on the walls was a dirty dark color, and the room was poorly lighted. Now such conditions as these are deplorable, and we should do all that we possibly can to improve them. The same conditions are found in schools scattered over the entire State. In one of the northern counties quite similar to those described above were found in the schools of a particular township. The adjoining township, however, was entirely different, the contrast being very marked. The school buildings were

neat and clean, well lighted, heated and ventilated. Drilled wells were provided in front of the buildings and to the rear the privies were screened and provided with water-tight vaults; toilet paper, tissue towels and individual drinking cups were found. The township Board of Education could justly feel proud of the conditions as they existed in their school. The health officer and local board of health can do a great deal in securing improvements in the sanitary conditions about the schools. Their field of operation, however, is not limited by the schools alone, but extends over the entire community.

In making surveys in different parts of the state and in the inspection of various conditions which have been complained of, very different attitudes have been found as regards the health officer. In some communities it is only necessary for the health officer to suggest that improvements be made, while in others it is practically an impossibility to secure any co-operation. In those communities where the people are quick to act, you will find clean alleys, clean streets, clean back yards and the condition of privies and wells very good. It has been observed that where co-operation is found, the health officer has been busy spreading the gospel of health and cleanliness to the people. Where the most trouble is found the health officer is but lightly interested in his work and is not taking it seriously.

Not only does the improvement of sanitary conditions protect the people against the spread of disease, but it also elevates them to a higher plane of living. The amount of benefit derived from the education of the people regarding public health work is impossible to estimate, but as they become educated, their appreciation is shown by the manner in which they comply with public health regulations and also in their reward to the health officer.

A STUDY OF HOUSING CONDITIONS IN CIRCLEVILLE.*

ELIZABETH LONG,

Ohio State University, Columbus, Ohio.

We consider ourselves fortunate indeed to present this first-hand study of housing conditions in one of the smaller cities of the state. Much has been written concerning the housing problems of the large cities of the country but little if anything has been written on the subject touching this smaller class of cities. We hope this is the first of a series of similar studies to be made in other cities in Ohio. The findings in this report are not to be taken as peculiar to Circleville, as they can be duplicated in practically every city in the state.—
[EDITOR'S NOTE.]

Circleville is a city of about 7,000 inhabitants, located in Pickaway county of which it is the county seat. It is situated on the east bank of the Scioto River just below its confluence with Big Darby creek, and is easily accessible by means of steam and electric railroads. The city is neither a wholly manufacturing nor a wholly residential community but rather a combination of the two.

The leading industry is canning. There are, also, however, plants for the manufacture of strawboard, cigars, brooms, gloves, and carriages, besides a grain elevator, grinding mill and some small establishments making boxes and baskets.

Wages in Circleville are generally not high, as shown in the accompanying table. (Table I.) This table shows the figures for Pickaway county. Circleville, however, is the only city in the county and the concentration of industry is at that point. The information on which this table and the one following is based is secured from reports of employers to the Department of Investigation and Statistics of the Industrial Commission of Ohio.

* This study was made at the instance of the Monday Club of Circleville, Ohio, a group of women who in the spring of 1915 became acquainted with facts which impressed them with the need of interesting their city authorities in some plan for improving the living conditions of a large number of their working population. The study was made by students of the department of sociology at Ohio State University, under the supervision of Miss Mary Louise Mark, instructor in statistics. The field work was done by Miss Elizabeth Long, Miss Dorothy Griggs, and Miss Lillian Coler. The report was prepared by Miss Long

TABLE I.

CLASSIFIED WEEKLY WAGES OF MALE WAGE EARNERS EIGHTEEN YEARS OF AGE AND OVER, FOR THE WEEK OF GREATEST EMPLOYMENT DURING THE YEAR ENDING DECEMBER 31, 1914, BY INDUSTRY GROUPS.

Industry Group.	Number of establishments reporting.	Number receiving per week --													Total.
		Under \$4.	\$4 and under \$5.	\$5 and under \$6.	\$6 and under \$7.	\$7 and under \$8.	\$8 and under \$9.	\$9 and under \$10.	\$10 and under \$12.	\$12 and under \$15.	\$15 and under \$18.	\$18 and under \$25.	\$25 and under \$35.		
Manufacturing	8	1	1	1	3	6	4	99	35	32	18	16	1	217	
Trade	13					1	3	1	16	18	1	2	3	45	
Food	2	5	1	3	2	5	3	1	124	46	31	12	1	249	
Public Utilities.....	3	1			1	1	1	16	3	37	2	3		49	
Service	3			1	1			2	1	2	3	2		12	
Construction	3			1	1		1	2	5	13	2			25	
Total.....	38	7	2	6	8	13	12	120	184	148	57	35	5	597	

Table I is for the year ending December 31, 1914. It shows the classified weekly wages of all male wage earners 18 years and over for the week of greatest employment during the year, by industry groups. From the total it will be seen that the greatest numbers of workers earn \$10 and under \$12 a week.

It will be further seen that this concentration in the total is due to the great concentration in the food industry, principally canning. Ten to twelve dollars may not seem an unduly low wage for unskilled workers in a city the size of Circleville, but when translated into annual earnings, a wage of \$10 to \$12 per week in the canning industry with its short season means poverty for the wage earner and his family unless he can find other employment during the rest of the year. For this reason many wage earners are willing to work for a much lower wage in another industry if they can have employment continuously throughout the year. Thus manufacturers in Circleville have, during most of the year, a large supply of cheap labor available. In the table we see that the greatest concentration in the manufacturing group occurs in the \$9 and under \$10 class. In this group, however, nearly half (102) earn more than \$10, the point of concentration. No doubt the proportion of skilled workers is high in the group.

Table II gives some idea of the unemployment in the course of a year, by showing the number of male wage earners 18 years of age

and over employed on the fifth of each month, by industry group. The figures are for the whole of Pickaway county and cover the year 1914.

TABLE II.

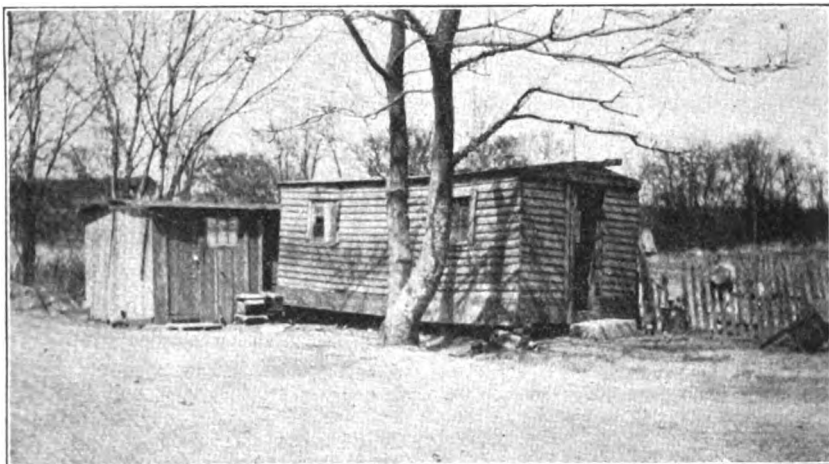
MALE WAGE EARNERS EIGHTEEN YEARS OF AGE AND OVER EMPLOYED ON THE FIFTH OF EACH MONTH, BY INDUSTRY GROUPS.

Industry Group.	Number of establishments reporting.	Number employed on the fifth of —											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Manufacturing	8	200	201	197	154	195	208	185	184	191	184	175	167
Trade	12	43	42	42	41	38	39	38	38	38	39	43	47
Food	8	47	48	49	66	59	192	151	227	222	181	119	64
Public Utilities.....	3	23	25	23	23	24	24	25	51	25	25	25	25
Service	3	12	12	12	12	12	12	12	12	12	12	12	12
Construction	3	12	11	12	12	24	25	18	19	22	19	15	14
Total.....	37	337	339	335	308	352	495	429	531	510	460	389	329

It will be seen that the number employed varies from 308 in April to 531 in August. Here again the food industry is the most important cause of fluctuation in the total figures, although its influence is somewhat offset in several instances by the other industries. In the Food group, however, it is interesting to note how the fluctuations follow the crops. The number of employees jumps suddenly from 59 in May to 192 in June with the coming on of spinach, peas, and early string beans; falls off to 151 in July as the earlier crops begin to dwindle; jumps to 227, the maximum, in August with the coming of the sweet corn, the big crop in Circleville; continues almost at the maximum (222) through September with corn and tomatoes; drops considerably in October (181) with the passing of the sweet corn but continues fairly high (119) through November with the last of the tomatoes and pumpkins, and drops decidedly (64) in December.

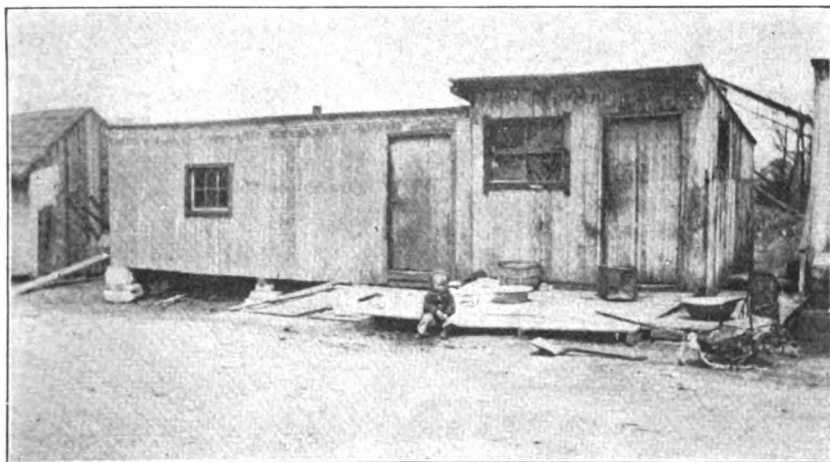
This table gives only a partial indication of the amount of unemployment. It does not for instance include the great numbers of people who work on the farms which supply the crops for canning, an employment which is also of necessity highly seasonal. A factor, however, which tends to lessen the actual amount of unemployment in the city of Circleville is the fluctuation in the local labor supply. Transients from the rural districts of southern Ohio come to Circleville for the canning season, but my informants differed as to the number of these temporary residents and as I was unable to verify

the facts personally I cannot state the extent to which this condition exists. The workers who come in this way either live in tents or crowd into close quarters with friends already in Circleville. There



is some tendency for these people to remain in Circleville during the dull season as well.

Health conditions in the canning factories are, almost of necessity, bad. The extreme heat, moisture, dirt, noise, hurry, confusion,



and long hours, and the piece work basis of pay are a decided menace to the health of the workers. Added to this are the dangers of lead poisoning from the process of soldering the cans and the dangers

of infection from very insanitary toilet arrangements. In the other establishments such as the strawboard factory, working conditions are far from ideal but are probably no worse than in similar factories elsewhere.

Health conditions in the city as a whole may be said to be good. Circleville has good natural drainage and a sewerage system that is considered adequate for a city of its size. Its city water is supplied by the Circleville Water Supply Company, a private corporation, and is of good quality from a sanitary standpoint and safe for domestic use. The streets are clean and well kept. The typhoid rate is low; there has been but one epidemic in recent years. In 1913 there were 10 cases as the result of contamination of the water supply



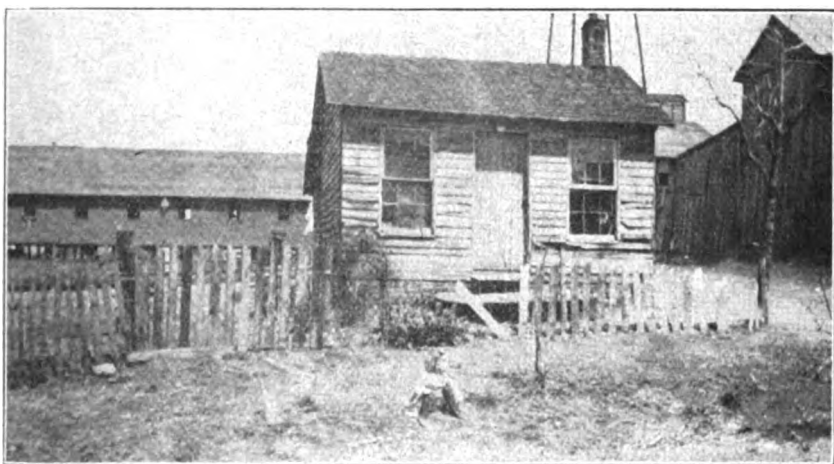
through a private connection, which affected only one portion of the city.

There are several conditions, however, which are not so favorable. First, there is no system of garbage collection and disposal. Second, a branch of the abandoned Ohio canal lies on the outskirts of the city where its stopped up channel forms a breeding place for disease. Third, several open ditches exist within the city limits, notably the one behind the houses on Lover's Lane. This ditch often overflows and covers the yards in rainy seasons. Even when it stays within its banks it is a menace to health, for its water is undoubtedly contaminated by the numerous privies located along its bank.

The population of Circleville at the 1910 census was 6,774. Of these 376 were negroes, 197 foreign born whites and the remainder

(6,171) native born whites. The negro settlement is of long standing but the number of negroes in the city has been declining since 1890.

Circleville is considered a rather wealthy town for its size. Like a great many county seats located in rich farming counties, it attracts wealthy farmers of the county who wish to come to the city to educate their younger children or merely to spend their old age more comfortably. Besides these there are the usual number of professional and business men, and the working population employed in the various industrial establishments or on the surrounding farms. Many of these appear to be unskilled and rather inefficient workers from the hill districts of southern Ohio who have been attracted to Circleville by the fairly high wages paid during the canning season,



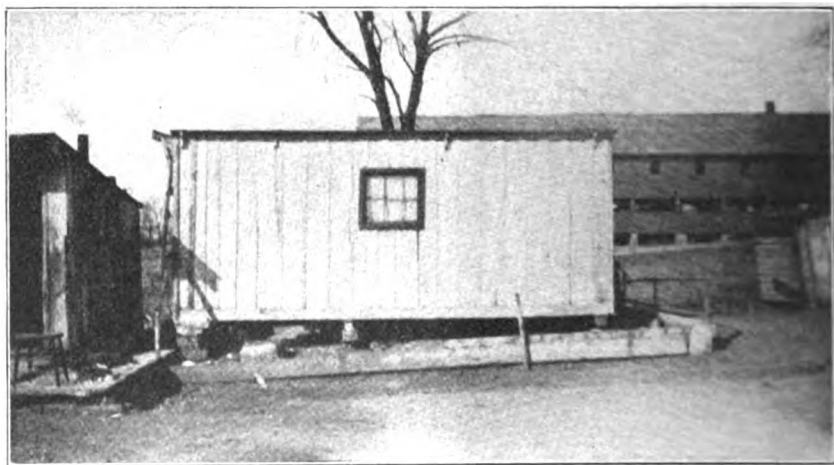
but who have remained there permanently either continuing to work for the canning factories in season and eking out a bare existence by doing "anything they can get to do" for the rest of the year, or being willing to take lower wages in some other industry which offers more continuous employment. It was among these people that we found the conditions for our study.

The household was taken as the unit for the study. Schedules filled out in the presence of the informant were obtained for 133 households comprising 586 persons. We usually introduced ourselves as from the public health nurse, Miss Charlotte Phelps, although in most cases I am convinced that even this was unnecessary, since the people generally seemed quite willing to give the desired information. In some cases they inquired as to the purpose of the

investigation; in many they do not. In a very few cases, mostly property owners, they were somewhat surly and suspicious and in one case absolutely refused to give any information other than that they owned their property. For the most part they were really cordial and were willing to sit and talk as long as we would stay.

The 133 schedules are probably quite representative of the conditions among the poorest class of the working population but the number includes by no means all households living under these conditions. The general consensus of opinion of the visitors was that a total of 300 schedules might have been taken without materially altering the character of the results obtained.

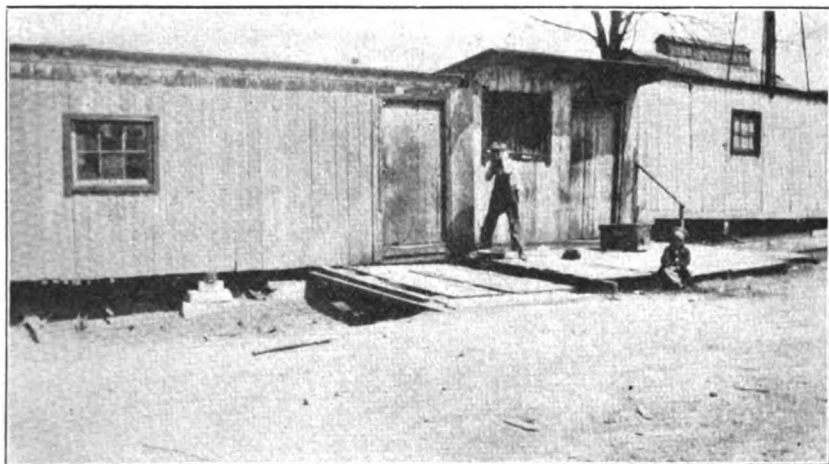
The method of selection was by districts. We took a characteristic district and covered it completely, visiting all households on both



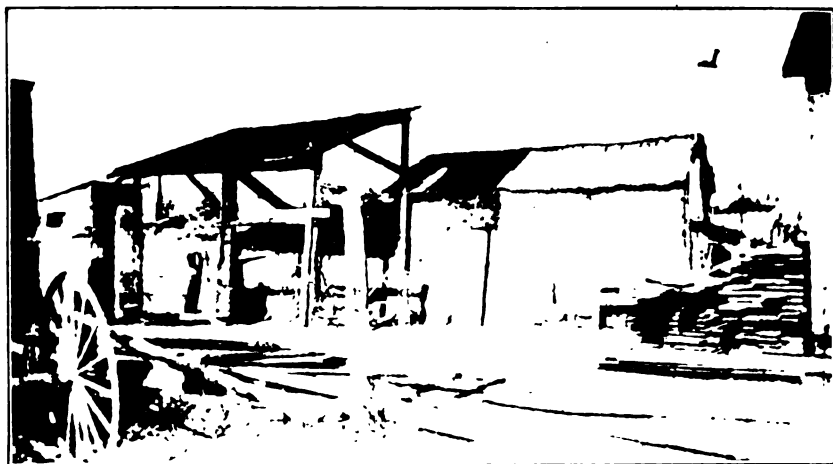
sides of the streets except in the few cases where all members of the family were away from home. There were four such districts—"Briertown", "Beantown", "Tatertown" and the East End. The East End was somewhat more scattered than the others. It might in fact be considered a number of smaller districts—the East End proper (E. Mound St., E. Mill St., and Abernathy Ave.), the Alleys (Pearl and Long Alley), the Gravel Pit (Watt St.) and Lover's Lane (Floral Ave.).

These districts do not vary greatly in general character. Local differences such as natural drainage somewhat affect conditions, but in general one district is no worse than another. Each in fact contains some good and some bad houses. On the whole the worst spot is "Rat Row" in Briertown which is really the end of W. Mill St.,

the block between the railroad and the river. The houses here are all of the car-shack type, that is, they are shaped like railroad cars, so that although not actually on wheels they may be easily moved about from place to place.



The car shacks in "Rat Row" are all on city land — as a matter of fact are really in the street — where people are allowed to squat rent free. One man who lives in two cars values the two of them at



\$15; another man who has only one, which is, however, in fairly good repair, values his at \$50. There are a few of these cars scattered through the other districts but while they are a striking phenomenon

and are rather characteristic on the whole, they are not numerically important.

The great majority of the houses are one-story or story-and-a-half frame houses or shacks of two or three rooms. Hardly a house in any of these districts can be considered in really good repair. The roof in some cases is the worst feature of the house. In a number of dwellings there are large cracks in the siding through which the daylight may be plainly seen. In some cases these holes are partially repaired by tacking over them sheets of tin made by flattening out old tin cans. Many houses are not plastered at all and in others what plaster there is, is falling off. Very few are papered and in most of these the paper is old, torn and dirty. Many window panes are lack-



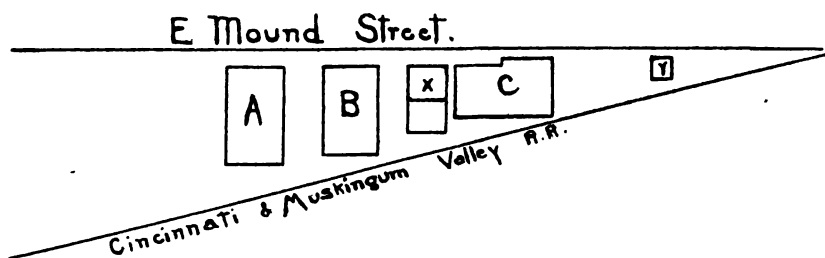
ing and few window or door casings fit tightly. A very small number of dwellings have cellars but many do not even have good foundations. The car-shacks have no foundations at all but are merely set up on piles of bricks or stones. Many of the other houses are not much better off in this respect. Holes in the foundations were reported, varying in length from a few inches to six feet. On some streets there is not a single good floor.

The subject of repair is closely connected with that of heating. In order to keep decently warm, people housed under the conditions described in the preceding paragraph must necessarily spend a large proportion of their income for fuel. Nearly all of the households have a heating stove in addition to the stove for cooking and apparently consume large quantities of fuel. Coal is chiefly used al-

though some wood is also burned. Only kerosene is used for illumination. We found no gas for either heating or lighting among the 133 households.

The yards are for the most part dirty and cluttered. As there is no public garbage collection, many families throw their refuse out on the yard, while others pile it up in unsightly and insanitary piles on the back of the lot or in the alley until they can have it hauled away. A few — a very few — keep it in barrels or boxes. Manure and ashes are similarly disposed of. The yards are in many instances badly drained. People in various localities complained that the water stands in their yards after it rains, making their surroundings very disagreeable as well as unhealthful.

Toilet facilities are very bad. In the first place toilets are inadequate to the number of households. A large proportion of these are divided into two or more compartments for the use of a number of different families. In such cases each family is generally sup-



posed to have an individual compartment but since there are no locks the tendency is toward promiscuous use. Many are ramshackle affairs so leaky that they cannot be used in bad weather. In some cases the door is missing; in others, boards are gone from the sides. In one locality visited the railroad and the street converge and dwellings are located in the narrow triangle formed in this way. The space is so narrow that the houses have no back yards at all. The toilet (a double affair, combination coal shed and toilet) used by the families in the second and third houses, is located on the street between the first and second houses, as shown in the diagram. A, B, and C are the three houses. X is the toilet used by A and B, and Y the one used by C. The people who live in A must pass in front of B in order to enter their half of the toilet X. But one of the worst features of this situation is that X is so close to house C that the people living there are unable to have their windows open in the summer on ac-

count of the odor. This condition is made worse by the fact that the vault is very shallow and is not cleaned out as often as it should be.

The complaint with regard to the depth of the vault and the infrequency of cleaning is general. In some cases the vault is no more than a box or barrel sunk a few feet in the ground that contaminates the earth for many feet around it and constitutes a serious danger to wells.

With the water supply the great trouble is the inadequacy of the accommodations. Only one of the houses visited has a faucet in the house and only seven others have city water on the lot. These have hydrants in the yard. The city water is supplied by a private corporation and is, perhaps, for that reason, expensive. Extensions, I understand, are also expensive. From the point of view of the water company the rates charged are not excessive since from two to a dozen families generally use each hydrant. Of course for the best interests of the public, and perhaps even of the water company itself, a larger number of hydrants at a lower rate would be vastly preferable. One hundred and eight of the 133 families do not have access to city water but use wells and cisterns. Even here the supply is insufficient for their needs. In several cases practically everyone on the street uses water from one well. A woman on Maplewood Avenue in Briertown remarked that as wells and cisterns dry up they have to go farther and farther for water, sometimes several blocks. "In summer", she said, "people on this street are lucky if they can get a drink."

Table III shows clearly the inadequacy of the present water supply.

TABLE III.

NUMBER OF HOUSEHOLDS HAVING WATER ALL ON LOT, ALL CARRIED, OR PART ON LOT AND PART CARRIED, BY RACE AND BY SIZE OF HOUSEHOLD.

Race and size of household.	Total number of households.	Number of households having water —		
		All on lot.	All carried.	Part on lot and part carried.
Total	133	60	61	12
1 person	8	3	5	..
2 persons	31	14	14	3
3 persons	20	6	10	4
4 persons	15	12	15	..
5 persons	15	8	6	1
6 persons	16	6	7	3
7 persons	8	4	4	..
8 persons	8	1	6	1
9 persons	5	3	2	..
10 persons	3	1	2	..
11 persons	2	2	..	..
White	103	46	48	9
1 person	5	1	4	..
2 persons	18	7	8	3
3 persons	14	5	7	2
4 persons	16	11	5	..
5 persons	15	8	6	1
6 persons	12	5	5	2
7 persons	8	4	4	..
8 persons	8	1	6	1
9 persons	4	2	2	..
10 persons	2	1	1	..
11 persons	1	1	..	..
Negro	30	14	13	3
1 person	3	2	1	..
2 persons	13	7	6	..
3 persons	6	1	3	2
4 persons	1	1	..	..
5 persons .....	..	..	..	..
6 persons	4	1	2	1
7 persons .....	..	..	..	..
8 persons .....	..	..	..	..
9 persons	1	1	..	..
10 persons	1	..	1	..
11 persons	1	1	..	..

This table shows the number of households that have water on their own lot, the number that carry all of their water for drinking, cooking, scrubbing, laundry work and bathing, and the number that carry part of their water. These latter are generally those who have water on their lot which may be used for all purposes except drinking and cooking. The totals of this table show that of the 103 white households, 48, representing 225 persons, must carry all of their water; 46 (219 persons) are fortunate enough to have all their water on their own lot; the other nine households (37 persons) carry part of their water but have some on the lot. One often hears this remark: "Well, those people may be poor but there is no excuse for their being dirty." Perhaps if the people who say this with so smug an air, had to carry all the water for a family of seven or eight from a well or hydrant a square away, or even from next door, they might be willing to find some excuses for not being quite so clean as people who need only to turn on a faucet in their own kitchen or bathroom.

The negro households appear to be slightly better off with regard to the water supply than the white. Of the 30 households 14 (49 persons) have their water supply on their own lots; the other 16 (56 persons) must carry all or part of their water.

As stated above the great majority of the household do not have access to city water. Only 8 households have hydrants on their own lots. Sixty-two of the white and 19 of the negro households, making a total of 81, use well water alone. Nineteen of the white and seven of the negro households have both well and cistern water. It may be seen therefore that most of the people have only hard water for all purposes. Anyone who has tried using well water for bathing or even for washing dishes will realize the inconvenience which hard water entails. The danger of the contamination of wells by insanitary toilets and surface drainage is a serious feature of this situation.

TABLE IV.

NUMBER OF HOUSEHOLDS HAVING WATER ALL ON LOT, ALL CARRIED, OR PART ON LOT AND PART CARRIED, BY RACE AND BY KIND OF WATER SUPPLY.

Race and kind of water supply.	Total number of households.	Number of households having water —		
		All on lot.	All carried.	Part on lot and part carried.
Total	133	60	61	12
Hydrant	20	8	12	.....
Hydrant and cistern.....	5	3	1	1
Well	81	36	44	1
Well and cistern.....	26	12	4	10
Cistern	1	1	.....	.....
White	103	46	48	9
Hydrant	16	6	10	.....
Hydrant and cistern.....	5	3	1	1
Well	62	28	34	.....
Well and cistern.....	19	8	3	8
Cistern	1	1	.....	.....
Negro	30	14	13	3
Hydrant	4	2	2	.....
Well	19	8	10	1
Cistern	7	4	1	2

In city housing investigations crowding is always one of the most striking features. Over-crowding although not of the city tenement type also exists in Circleville. There are not many cases in which lot-crowding is a noticeable evil, but there are enough to show the dangers of allowing such conditions to grow unchecked. The difficulty of making any very definite statement about this situation is due to the confusion in the minds of the tenants in regard to lot lines. But at least five cases were found in which such overcrowding is obvious.

The overcrowding in rooms is a more serious situation. The following tables show the number of rooms used, by the size of the households. We have taken the number of *rooms used* as a better indication of actual conditions of crowding than the number of *rooms per apartment*, for the 11 households with unused rooms would in most cases have occupied such rooms had they not been in a condition of extremely bad repair.

TABLE V.

NUMBER OF ROOMS PER APARTMENT, BY RACE AND BY SIZE OF HOUSEHOLD.

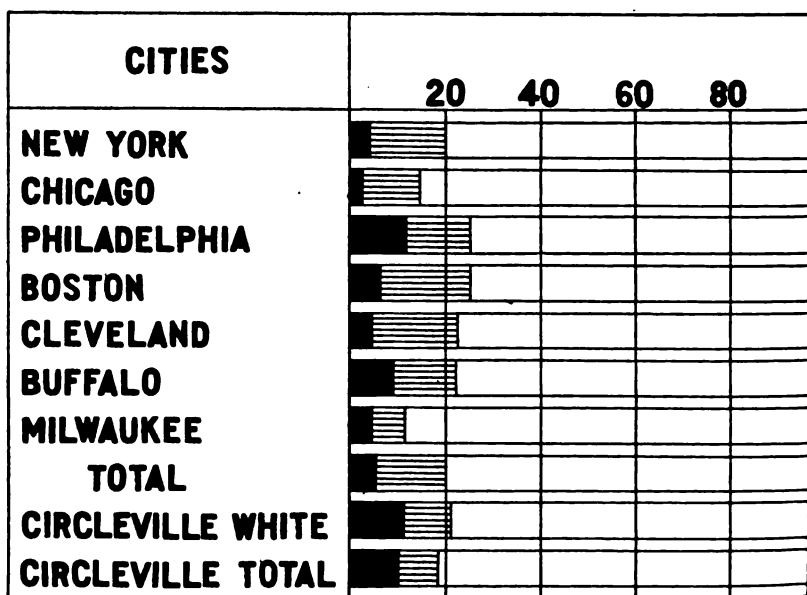
Race and size of household.	Total number of households.	Number of households using each specified number of rooms.							
		1	2	3	4	5	6	7	8
Total	133	3	35	49	27	11	4	3	1
1 person	8	1	3	4	...	...	...	...	...
2 persons	31	...	13	10	6	1	...	1	...
3 persons	20	1	5	6	4	2	2	...	...
4 persons	17	1	3	5	6	1	1	...	...
5 persons	15	...	5	7	2	1	...	...	...
6 persons	16	...	4	5	4	2	...	1	...
7 persons	8	...	...	2	3	2	...	...	1
8 persons	8	...	1	6	...	1	...	...	...
9 persons	5	...	1	3	...	...	...	1	...
10 persons	3	...	...	1	1	1	...	...	...
11 persons	2	...	...	...	1	...	1	...	...
White	103	2	28	39	20	8	3	2	1
1 person	5	1	3	1	...	...	...	...	...
2 persons	18	...	6	6	4	1	...	1	...
3 persons	14	...	5	5	2	1	1	...	...
4 persons	16	1	3	4	6	1	1	...	...
5 persons	15	...	5	7	2	1	...	...	...
6 persons	12	...	4	5	2	1	...	...	...
7 persons	8	...	...	2	3	2	...	...	1
8 persons	8	...	1	6	...	1	...	...	...
9 persons	4	...	1	2	...	...	...	1	...
10 persons	2	...	...	1	1	...	...	...	...
11 persons	1	...	...	...	...	...	1	...	...
Negro	30	1	7	10	7	3	1	1	...
1 person	3	...	...	3	...	...	...	...	...
2 persons	13	...	7	4	2	...	...	...	...
3 persons	6	1	...	1	2	1	1	...	...
4 persons	1	...	...	1	...	...	...	...	...
5 persons .....	...	...	...	...	...	...	...	...	...
6 persons	4	...	...	...	2	1	...	1	...
7 persons .....	...	...	...	...	...	...	...	...	...
8 persons .....	...	...	...	...	...	...	...	...	...
9 persons	1	...	...	1	...	...	...	...	...
10 persons	1	...	...	...	...	1	...	...	...
11 persons	1	...	...	...	1	...	...	...	...

Among the 103 white households shown in the above table the average number of rooms per household is 3.2. Thirty households occupy only one or two rooms, 69 do not have more than three rooms, and 89 not more than four rooms; the remaining 14 households occupy five or more rooms. The average number of persons per apartment

is 4.6; the average number per room 1.4. Robert Chapin in his study of the standard of living among workingmen's families in New York applies the rule that an average of more than 1.5 persons per room constitutes overcrowding. If this figure is taken as a standard 44 of the households are overcrowded. But these forty-four households comprise 287 persons, 59.7 per cent of the total number, which means that more than half of the 481 white persons live in apartments in which there are less than two rooms to every three persons. Moreover in 24 of the 44 households the average number of persons per room is more than two. These 24 households include 170 persons, or 35.3 per cent of the total, which means that over one-third of the 481 white persons live in apartments in which there is less than one room to every two persons—really serious overcrowding. These households include most of the larger households, the average for the 24 being slightly over seven persons per household, which is decidedly above the average for the whole 103 (4.7).

It would be desirable to compare Circleville with other places of its size if figures for this purpose were available. The comparison with city conditions is, however, not without value, for the impression is widespread that the evils of congestion are confined to the great centers of population. Mrs. More in her study of budgets of wage earners on the lower west side of New York found only 37 families or 18.5 per cent of the whole in which the average number of persons per room was more than two. Our study shows 23.3 per cent. As example of overcrowding Mrs. More says: "In the number [the 37 families mentioned above] were several instances of eight living in three rooms, 10 persons in four rooms, one family of six lived in two rooms, but the two worst examples of overcrowding were 10 persons in three rooms." Table V of our study shows six instances of eight persons living in three rooms, one of 10 persons living in four rooms, four households of six living in two rooms, and a parallel for her worst case—10 persons in three rooms. Besides these are three cases of even worse overcrowding—one household of eight living in two rooms, one household of nine in two rooms, and one household of four in one room. It may be added that in the canning season the proportion of cases of extreme overcrowding would probably be found to be considerably higher. As compared with overcrowding in city tenements, however, there is one alleviating circumstance. The Circleville households are for the most part made up of natural families; in other words the congestion is not to any great extent due to the presence of boarders and lodgers.

The chart which follows compares room congestion in Circleville and in seven large cities. The information on which this chart is based is taken from the report of the United States Immigration Commission on Immigrants in Cities and is based on an investigation of the poorest tenent districts. Two degrees of overcrowding are represented by two different degrees of shading on the horizontal bars, the unshaded part of the bars representing for each city the percentage of households averaging under two persons per room. Since the per-



2 TO 3 PERSONS 3 OR MORE PERSONS

centage of negroes in the figures for the large cities is very slight as compared with Circleville a separate showing is made for the Circleville white households.

The chart shows graphically the same thing that comparison with Mrs. More's less extensive study reveals, namely that the worse the degree of overcrowding under consideration, the less satisfactory is the showing of the small city. Of the seven large cities only Philadelphia has a higher proportion of households than Circleville averaging 3 or more persons per room.

Another phase of over-crowding which is more serious both in its physical and moral aspects is the overcrowding of sleeping rooms.

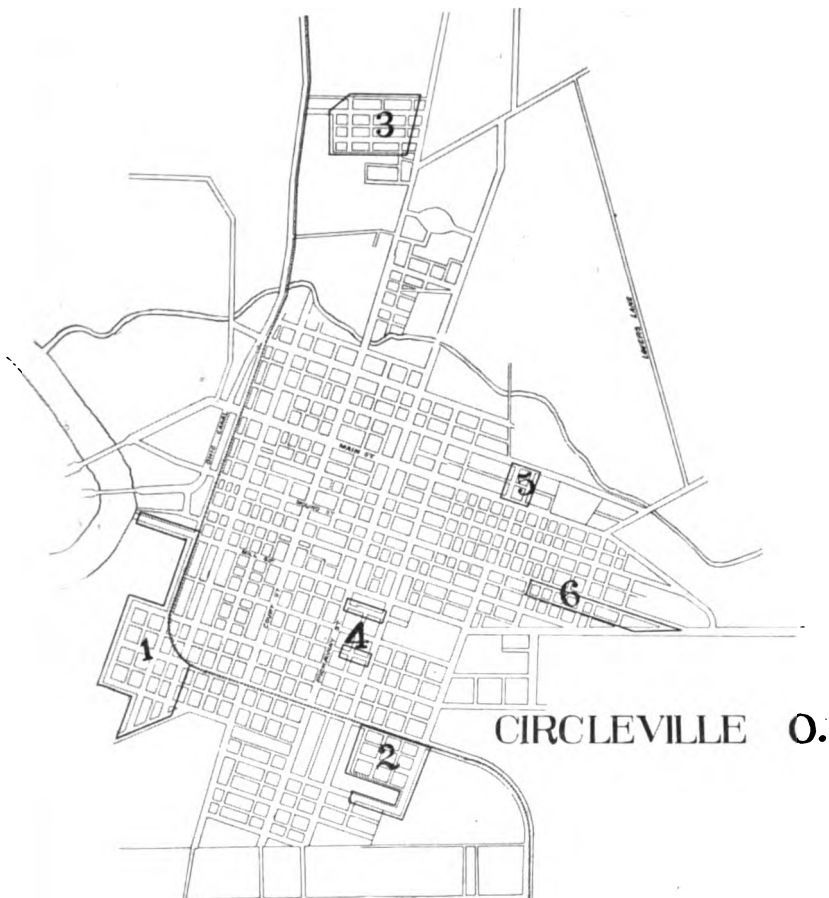


TABLE VI.

NUMBER OF SLEEPING ROOMS PER APARTMENT, BY RACE AND BY SIZE OF HOUSEHOLD.

Race and size of household.	Total number of households.	Number of households using each specified number of rooms.				
		1	2	3	4	Not reported.
Total	133	74	44	11	3	1
1 person	8	8	.....	.....	.....	.....
2 persons	31	26	4	.....	.....	1
3 persons	20	12	8	.....	.....	.....
4 persons	a18	8	8	2	.....	.....
5 persons	15	11	4	.....	.....	.....
6 persons	16	7	7	1	1	.....
7 persons	8	.....	4	3	1	.....
8 persons	7	1	6	.....	.....	.....
9 persons	5	1	2	2	.....	.....
10 persons	3	.....	1	2	.....	.....
11 persons	2	.....	.....	1	1	.....
White	103	56	37	8	1	1
1 person	5	5	.....	.....	.....	.....
2 persons	18	13	4	.....	.....	1
3 persons	14	10	4	.....	.....	.....
4 persons	a17	8	7	2	.....	.....
5 persons	15	11	4	.....	.....	.....
6 persons	12	7	5	.....	.....	.....
7 persons	8	.....	4	3	1	.....
8 persons	7	1	6	.....	.....	.....
9 persons	4	1	2	1	.....	.....
10 persons	2	.....	1	1	.....	.....
11 persons	1	.....	.....	1	.....	.....
Negro	30	18	7	3	2	.....
1 person	3	3	.....	.....	.....	.....
2 persons	13	13	.....	.....	.....	.....
3 persons	6	2	4	.....	.....	.....
4 persons	1	.....	1	.....	.....	.....
5 persons .....	.....	.....	.....	.....	.....	.....
6 persons	4	.....	2	1	1	.....
7 persons .....	.....	.....	.....	.....	.....	.....
8 persons .....	.....	.....	.....	.....	.....	.....
9 persons	1	.....	.....	1	.....	.....
10 persons	1	.....	.....	1	.....	.....
11 persons	1	.....	.....	.....	1	.....

a Including one family of 8 persons, 4 of whom habitually sleep at the home of relatives.

Among the white households the average number of persons per sleeping room is 3.0. Of the 102 households for which the number of sleeping rooms was reported, 43 average more than three persons per sleeping room. Among the households using only one sleeping

room are eight households of four persons, eleven households of five, seven households of six, one household of eight and one of nine. The household of nine who slept in one room was notorious in its neighborhood.

The average for the 30 negro households is 2.3 persons per sleeping room. Although 18 of the 30 households use only one sleeping room each, the largest household of the 18 consists of only three persons. In three negro households there is serious overcrowding of sleeping rooms. In one case nine persons sleep in two rooms, in another 10 sleep in two rooms and in the third 11 persons sleep in three rooms.

The number of rooms used by a household for sleeping purposes is largely a matter of individual choice. City tenement dwellers where rents are high and rooms at a premium have learned to utilize at night rooms used for other purposes during the day and even in the kitchen a cheap folding bed is a common article of furniture. A comparison of Circleville households with the tenement households studied by the United States Immigration Commission is full of significance. The table includes only the greater degrees of overcrowding.

TABLE VII.

OVERCROWDING IN ROOMS AND IN SLEEPING ROOMS, BY CITIES.

Cities.	Per cent of households having —			
	Per room —		Per sleeping room —	
	2 to 3 persons.	3 or more persons.	4 to 5 persons.	5 or more persons.
New York	19.9	3.3	4.3	0.9
Chicago	15.4	1.7	6.1	1.8
Philadelphia	24.8	11.7	11.4	7.3
Boston	25.4	7.1	6.6	1.7
Cleveland	22.5	4.0	8.0	4.8
Buffalo	23.0	8.0	9.5	3.5
Milwaukee	11.9	2.5	8.8	6.4
Total	20.1	4.8	7.0	3.0
Circleville, white	20.4	10.7	18.6	20.6
Circleville, total	17.4	9.7	14.4	15.9

It will be seen that in respect to room overcrowding, which is largely determined by the size of the family and the amount of money available for rent, Circleville does not compare so unfavorably with the cities as in respect to the overcrowding of sleeping rooms, a matter that lies much more largely within the choice of the household. It might be inferred that in the small city, bed rooms are large as compared with tenement sleeping rooms, but as a matter of fact all rooms in these poorly built houses are small. Apparently these people of an old American stock are less adaptable to urban conditions than are immigrants as a class and cling to the American tradition of keeping certain rooms of the house sacred to certain household uses even when by so doing they injure health and endanger moral standards. The visitor cannot but question the complacent remark of one of the old ladies: "You will find many poor people in Circleville, but we are not so degraded as the poor in the big cities."

The facts regarding living conditions in these neighborhoods may be summarized briefly: (1) A condition of overcrowding which, all things considered, cannot be said to be less acute than the room congestion in the tenement districts of large cities; (2) A high proportion of dwellings unfit for occupancy on account of their state of dilapidation; (3) The water supply inadequate and inconvenient at all times of year and in some cases precarious during dry seasons; (4) Toilet accommodations primitive and inadequate in numbers; (5) The disposal of garbage not attended to by the city and satisfactory from a sanitary point of view only in a few instances.

In a small city and under conditions such as these one would not expect to find rents high, and as a matter of fact they are low as compared with large cities. The proportion of the family income that is spent for rent is quite another question. Now and then one hears among these people the familiar lament of the city tenement house dweller that after the rent is paid little is left to live on. But no instances of gross overcharging were found and most tenants seemed content to pay their little for the little they get in return.

TABLE VIII.

NUMBER OF HOUSEHOLDS OWNING HOME AND NUMBER RENTING, BY SIZE OF APARTMENT.

Race and tenure.	Total number of households.	Number of households occupying each specified number of rooms.							
		1	2	3	4	5	6	7	8
Total	133	3	30	48	26	17	5	3	1
Renters	89	2	24	33	15	11	3	1	....
Property owners	36	1	4	9	11	6	2	2	1
Others	8	....	2	6	....	....	....	....	....
White	103	2	24	39	20	11	4	2	1
Renters	65	1	18	26	12	6	2	....	....
Property owners	31	1	4	8	8	5	2	2	1
Others	7	....	2	5	....	....	....	....	....
Negro	30	1	6	9	6	6	1	1	....
Renters	24	1	6	7	3	5	1	1	....
Property owners	5	....	....	1	3	1	....	....	....
Others	1	....	....	1	....	....	....	....	....

The subject of rents presents a number of difficulties of classification. Among the whites there are 65 renting households, 31 property owners and seven who are neither renters nor property owners and who are classified as "others" in the table. These "others" include: (1) three families who are living in houses owned by relatives, for which they are temporarily paying no rent, generally because of sickness or misfortune; (2) one household which pays no rent because the house has been condemned; (3) one household which owns a car and pays \$5 a year for the ground on which it stands; (4) one household which pays \$2 a month during the canning season but occupies the house rent free during the winter; (5) one household consisting of a widow with five children, who does not pay rent but occupies a house in miserable repair. Those households that own their own cars but pay rent for the ground on which they are located are classified as property owners.

Twenty-four out of the 30 negro households are renters. One family which has kept an old shack in repair for some time is allowed to occupy it rent free. This is the household classified under "others."

In Table IX apartments are classified according to size and tenure:

TABLE IX.

NUMBER OF HOUSEHOLDS OWNING HOME AND NUMBER RENTING, BY RACE
AND BY SIZE OF HOUSEHOLD.

Race and tenure.	Total number of households.	Number of households consisting of each specified number of persons.										
		1	2	3	4	5	6	7	8	9	10	11
Total	133	8	31	30	17	15	16	8	8	5	3	2
Renters	89	6	21	23	10	11	12	5	4	4	3	...
Property owners.	36	2	8	6	6	3	3	3	2	1	...	2
Others	8	...	2	1	1	1	1	...	2	...	...	...
White	103	5	18	14	16	15	12	8	8	4	2	1
Renters	65	3	10	9	10	11	8	5	4	3	2	...
Property owners.	31	2	7	4	5	3	3	3	2	1	...	1
Others	7	...	1	1	1	1	1	...	2	...	...	...
Negro	30	3	13	6	1	...	4	...	...	1	1	1
Renters	24	3	11	4	...	...	4	...	...	1	1	...
Property owners.	5	...	1	2	1	...	...	...	...	...	...	1
Others	1	...	1	...	...	...	...	...	...	...	...	...

Property owners appear to be distinctly less crowded than renters. The houses occupied by owners average 4.0 rooms while those occupied by tenants average only 3.2 rooms. The average number of persons per room is 1.1 in home owning households and 1.4 among tenants.

The 65 white households paying rent are classified in Table X according to the amount of rent they pay per month and according to the size of the apartment occupied.

TABLE X.

RENTS PAID PER MONTH, BY RACE AND BY SIZE OF APARTMENT.

Race and rent per month.	Total number of households renting	Number of households occupying each specified number of rooms.						
		1	2	3	4	5	6	7
Total	89	2	24	33	15	11	3	1
Under \$3.00	3	2	1	...	...	...	...	...
\$3.00 and under \$3.50	8	...	2	6	...	...	...	...
3.50 and under 4.00	8	...	6	...	2	...	...	...
4.00 and under 4.50	26	...	10	11	3	2	...	...
4.50 and under 5.00	4	...	...	1	3	...	...	...
5.00 and under 5.50	25	...	5	13	3	3	1	...
5.50 and under 6.00	1	...	...	1	...	...	...	...
6.00 and under 6.50	10	...	...	1	4	4	...	1
6.50 and under 7.00 .....	...	...	...	...	...	...	...	...
7.00 and over	4	...	...	...	...	2	2	...
White	65	1	18	26	12	6	2	...
Under \$3.00	1	1	...	...	...	...	...	...
\$3.00 and under \$3.50	6	...	1	5	...	...	...	...
3.50 and under 4.00	7	...	5	...	2	...	...	...
4.00 and under 4.50	22	...	8	9	3	2	...	...
4.50 and under 5.00	2	...	...	1	1	...	...	...
5.00 and under 5.50	18	...	4	10	3	...	1	...
5.50 and under 6.00	1	...	...	1	...	...	...	...
6.00 and under 6.50	5	...	...	1	3	2	...	...
6.50 and under 7.00 .....	...	...	...	...	...	...	...	...
7.00 or over	3	...	...	...	...	2	1	...
Negro	24	1	6	7	3	5	1	1
Under \$3.00	2	1	1	...	...	...	...	...
\$3.00 and under \$3.50	2	...	1	1	...	...	...	...
3.50 and under 4.00	1	...	1	...	...	...	...	...
4.00 and under 4.50	4	...	2	2	...	...	...	...
4.50 and under 5.00	2	...	...	...	2	...	...	...
5.00 and under 5.50	7	...	1	3	...	3	...	...
5.50 and under 6.00 .....	...	...	...	...	...	...	...	...
6.00 and under 6.50	5	...	...	1	1	2	...	1
6.50 and under 7.00 .....	...	...	...	...	...	...	...	...
7.00 or over	1	...	...	...	...	...	1	...

Rents vary from \$1.25 per month to \$7.50, but 43, or two-thirds of the renters, pay between \$4 and \$6; 14, or about one-fifth, pay under \$4.00; whereas only 8, or about one-eighth of the households, pay over \$6.00. The family which pays \$1.25 is the only one paying less than \$3.00 and of the families paying \$7 and over, two pay \$7 and one \$7.50 per month. The average monthly rent per apartment is \$4.43.

The average monthly rents per room paid by white tenants for houses of each size are as follows:

Two room houses.....	\$2.01
Three " "	1.43
Four " "	1.18
Five " "	1.13
Six " "	1.04

These averages, although based on a small number of cases, show that the families that rent the larger houses pay less per room than the families in the smaller dwellings.

Rents among the negroes vary from \$1.50 to \$8.00 but 13 of the 24, or more than half, pay between \$4 and \$6. The average rent per apartment is \$4.65 which is \$0.22 higher than the average for the white households. But since the apartments occupied by the negro families are, on the whole, larger, the average rent per room is \$0.07 lower than the average for the white families — \$1.33 as compared with \$1.40.

In Table XI the amount of rent paid is shown by the size of the household.

TABLE XI.

RENTS PAID PER MONTH, BY RACE AND SIZE OF HOUSEHOLD.

Race and rent per month.	Total number of households renting.	Number of households consisting of each specified number of persons.									
		1	2	3	4	5	6	7	8	9	10
Total	89	6	21	13	10	11	12	5	4	4	3
Under \$3.00	3	1	1	1							
\$3.00 and under \$3.50	8	3	3			2					
3.50 and under 4.00	8	1	3	1	1	1				1	
4.00 and under 4.50	26	2	7	1	3	5	2	1	2	2	1
4.50 and under 5.00	4		1	1			1		1		
5.00 and under 5.50	25	2	6	4	1	3		2	1		2
5.50 and under 6.00	1						1				
6.00 and under 6.50	10	1			3		3	2		1	
6.50 and under 7.00											
7.00 or over	4			2	1		1				
White	65	3	10	9	10	11	8	5	4	3	2
Under \$3.00	1				1						
\$3.00 and under \$3.50	6		1	3		2					
3.50 and under 4.00	7	1	2	1	1	1				1	
4.00 and under 4.50	22	1	4	1	3	5	2	1	2	2	1
4.50 and under 5.00	2		1						1		
5.00 and under 5.50	18	1	2	3	1	3	4	2	1		1
5.50 and under 6.00	1						1				
6.00 and under 6.50	5				3			2			
6.50 and under 7.00											
7.00 or over	3			1	1		1				
Negro	24	3	11	4			4			1	1
Under \$3.00	2		1	1							
\$3.00 and under \$3.50	2		2								
3.50 and under 4.00	1		1								
4.00 and under 4.50	4	1	3								
4.50 and under 5.00	2			1			1				
5.00 and under 5.50	7	1	4	1							1
5.50 and under 6.00											
6.00 and under 6.50	5	1					3			1	
6.50 and under 7.00											
7.00 or over	1			1							

The average rent per person for the 65 white households is \$0.94. All households of five persons or more fall decidedly below this average while households of four persons or fewer are decidedly above it. The average monthly rent per person in households of each specified size is as follows:

One person	\$4.17
Two persons	2.03
Three "	1.43
Four "	1.18
Five " .....	.81
Six " .....	.84
Seven " .....	.74
Eight " .....	.55
Nine " .....	.43
Ten " .....	.45

The average monthly rents per person among the negro as among the white households tends to decrease as the size of the household increases. The rent per person is considerably higher among negro than among white households, the apartments averaging a trifle larger and the households averaging smaller than among the whites.

CONCLUSION.

The housing situation in Circleville is unquestionably bad, no matter how one looks at it. It should be the concern of every inhabitant of the town, for insanitary conditions in a single district are a menace to the health of the people of every other district. As a matter of self-protection, if altruistic motives fail, every dwelling in every part of the city should have adequate water supply and sewerage connection and there should be proper garbage disposal. Further, landlords and owners should be compelled by city ordinance to maintain a decent degree of repair for all buildings used for residence purposes and condemned buildings should be vacated.

To raise the standard of housing conditions until the poorest would conform to the above requirements would almost surely increase the rentals in these poor districts very considerably. This would work hardship to some of the present residents and might possibly result in a greater degree of overcrowding. But ultimately the results would justify such a policy. At present Circleville by her low rentals invites a class of people who are willing to endure her low standards of housing, and so her population is augmented by country dwellers from the southern hill counties, many of whom have all the earmarks of an inferior stock and some of whom are open to strong suspicion, on casual meeting, of being degenerates of the pauper type, to whom casual work and miserable living conditions are no particular hardship. It is no kindness to such people to invite them to the town and, on the other hand, the town inevitably inherits burdens by such a policy. Such inhabitants may be a convenience to

employers of seasonal industries but employers will find another labor supply if the supply for this source is curtailed. Industries that cannot exist unless they pay wages too low to maintain a proper standard of living are in the long run no advantage to a locality, and most industries if deprived of a supply of such labor find ways of getting along very well without it. Since the population is somewhat shifting in character, the changes suggested would probably result in the migration of many of the less desirable families, while on the other hand the improvement of their surroundings would encourage the more ambitious and result in an increase of their efficiency in the industrial field.

A SUMMARY OF OCCUPATIONAL DISEASES AND DISEASES PARTLY OCCUPATIONAL REPORTED TO THE STATE BOARD OF HEALTH IN THE FIRST SIX MONTHS OF THE YEAR 1915, IN ACCORDANCE WITH SECTION 1234 1-3 (O. L., 103, 1913), AND ARRANGED ACCORDING TO U. S. CENSUS SYMBOLS.

E. R. HAYHURST, M. D.

Director, Division of Industrial Hygiene.

The accompanying table gives a list of industries in alphabetical order in which occupational diseases or diseases partly occupational (e. g. Tuberculosis) were reported to the state department of health during the first six months of the year 1915. The nomenclature given in the recent publication of the U. S. Census entitled "Index to Occupations, Alphabetical and Classified", has been adopted. The first column gives the standard symbol or number fixed for the occupational designation by the Census classifier. The second column states the name of the occupational designation in which the afflicted person was employed. The third column names the industry. Where parentheses are used, it implies that the worker, for instance, a "painter", was engaged in an industry (automobile factory) not specifically mentioned for that class of worker, i. e., the Census Classifier simply gives the number 329 for "any factory painter." Within the parentheses we indicate the specific employment.

The succeeding columns do not appear in the Census classification, but have been added to bring out other features. In the column for "Habits and Hazards," the asterisk (*) refers to the extent of alcoholism, as investigations determined; double asterisks meaning a more marked degree of alcoholism. The hazards refer to the industry only. The column for "Home conditions" grades these as *good*, *fair*, or *poor*, according to the reports of the social services maintained in the respective cities from which the reports were secured and are the *ensemble* results of the inspections made of such premises by visiting nurses or other qualified persons. The last three columns "Age", "Sex" and "Nativity" require no special explanation.

FOR DISEASES STRICTLY OCCUPATIONAL.

Total number of individuals.....	99
Lead poisoning	79
All others	20
Total number of occupations.....	22

Total number of industries.....	20
Males	95
Females	4

Nationalities: American, 33; Austrian, 9; English, 1; German, 6; Greek, 2; Hungarian, 10; Montenegrin, 2; Polish, 1; Russian, 10; Slavish, 14; not designated, 11.

FOR DISEASES PARTLY OCCUPATIONAL.

Tuberculosis, number of individuals.....	140
Total number of occupations.....	68
Total number of industries.....	46
Hazards reported, Dust.....	71
" " Changes of temperature.....	9
" " Fumes or gases.....	12
" " Steam or humidity.....	6
" " Monotony	2
" " Heat	9
" " Poor ventilation	1
" " Fatigue	2
" " Smoke	5
" " Other diseases	2
" " Not designated	27
Home conditions, Good.....	31
" " Fair	52
" " Poor	24
" " Not inquired into.....	33
Males	115
Females	25

Nationalities: American, 34; Austrian, 5; Bohemian, 3; Croatian, 5; English, 1; Finnish, 1; German, 11; Greiner, 2; Hebrew, 2; Hungarian, 17; Irish, 2; Italian, 1; Polish, 6; Roumanian, 3; Russian, 2; Slavish, 2; not designated, 42.

LEAD POISONING.

U. S. Census Symbol.	Occupation.	Industry.	Age.	Sex.	Nativity.
248	Laborer (Kiln-man)	Acid Works	23	M	Montenegrin.
248	Laborer (Kiln-man)	Acid Works	28	M	Austrian.
248	Laborer (Kiln-man)	Acid Works	34	M	Austrian.
248	Laborer (Kiln-man)	Acid Works	45	M	Austrian.
248	Laborer (Kiln-man)	Acid Works	40	M	American.
248	Laborer (Kiln-man)	Acid Works	21	M	Montenegrin.
248	Laborer (Kiln-man)	Acid Works	26	M	Austrian.
329	Painter	(Automobiles)	25	M	American.
328	Painter	(Automobiles)	23	M	American.
328	Painter	(Automobiles)	?	M	American.
328	Painter	(Automobiles)	42	M	Hungarian.
370	Finisher	(Automobiles)	34	M	Hungarian.
345	Finisher	(Automobiles)	?	F	American.
250	Glazer	Brick and Tile Works.	20	M	American.
250	Laborer	Brick and Tile Works.	21	M	American.
250	Tile Setter	Brick and Tile Works.	24	M	American.
250	Tile Setter	Brick and Tile Works.	24	M	American.
217	Cabinet Maker	Cabinet Factory	?	M	American.
217	Cabinet Maker	Cabinet Factory	34	M	Hungarian.
244	Laborer	Cabinet Factory	42	M	Hungarian.
328	Painter	Cabinet Factory	26	M	Hungarian.
460	Assembler	Electrical Mfg. (Batteries)	25	M	German.
460	Assembler	Electrical Mfg. (Batteries)	?	M	Slavish.
460	Assembler	Electrical Mfg. (Batteries)	25	M	Slavish.
460	Assembler	Electrical Mfg. (Batteries)	32	M	Austrian.
460	Assembler	Electrical Mfg. (Batteries)	29	M	Austrian.
460	Assembler	Electrical Mfg. (Batteries)	23	M	Hungarian.
460	Assembler	Electrical Mfg. (Batteries)	21	M	Slavish.
460	Assembler	Electrical Mfg. (Batteries)	34	M	Slavish.
460	Assembler	Electrical Mfg. (Batteries)	30	M	Slavish.

LEAD POISONING — Continued.

U. S. Census Symbol.	Occupation.	Industry.	Age.	Sex.	Nativity.
460	Assembler	Electrical Mfg.	26	M	Russian.
460	Assembler	Electrical Mfg.	23	M	Slavish.
460	Assembler	Electrical Mfg.	22	M	Russian.
460	Burner	Electrical Mfg.	22	M	Slavish.
284	Laborer	Electrical Mfg.	21	M	Greek.
284	Laborer	Electrical Mfg.	33	M	Slavish.
284	Laborer	Electrical Mfg.	21	M	Austrian.
284	Laborer	Electrical Mfg.	21	M	Russian.
284	Laborer	Electrical Mfg.	48	M	Polish.
284	Laborer	Electrical Mfg.	32	M	Russian.
284	Laborer	Electrical Mfg.	22	M	Russian.
284	Laborer	Electrical Mfg.	29	M	Russian.
284	Laborer	Electrical Mfg.	42	M	Austrian.
284	Laborer	Electrical Mfg.	26	M	Austrian.
284	Laborer	Electrical Mfg.	31	M	?
342	Mixer	Electrical Mfg.	33	M	Slavish.
460	Paster	Electrical Mfg.	33	M	Hungarian.
460	Paster	Electrical Mfg.	28	M	Russian.
460	Paster	Electrical Mfg.	45	M	American.
460	Paster	Electrical Mfg.	49	M	German.
460	Paster	Electrical Mfg.	25	M	Russian.
460	Paster	Electrical Mfg.	37	M	Slavish.
460	Paster	Electrical Mfg.	?	M	German.
460	Paster	Electrical Mfg.	35	M	Slavish.
460	Paster	Electrical Mfg.	33	M	Polish.
460	Paster	Electrical Mfg.	27	M	Hungarian.
460	Paster	Electrical Mfg.	26	M	Slavish.
460	Paster	Electrical Mfg.	35	M	Hungarian.
460	Paster	Electrical Mfg.	23	M	Slavish.
460	Paster	Electrical Mfg.	30	M	Greek.

460	Paster	Electrical Mfg. (Batteries)	26	M	Russian.
460	Paster	Electrical Mfg. (Batteries)	34	M	Austrian.
460	Paster	Electrical Mfg. (Batteries)	25	M	Slavish.
460	Paster	Electrical Mfg. (Batteries)	40	M	Slavish.
702	Watchman	Electrical Mfg. (Batteries)	27	M	German.
702	Watchman	Electrical Mfg. (Batteries)	27	M	German.
259	Laborer	Hardware Factory	22	M	?
340	Mixer	Paint Mfg.	27	M	Russian.
340	Mixer	Paint Mfg.	?	M	?
246	Laborer	Paint Mfg.	25	M	?
340	Oxidizer	Paint Mfg. (White Lead)	35	M	Hungarian.
340	Oxidizer	Paint Mfg. (White Lead)	31	M	American.
340	Oxidizer	Paint Mfg. (White Lead)	36	M	American.
265	Laborer	Paint Mfg. (White Lead)	20	M	American.
328	Painter	Painting n. s.	45	M	American.
328	Painter	Painting n. s.	30	M	American.
328	Painter	Painting n. s.	38	M	American.
328	Painter	Painting n. s.	40	M	American.
392	Pressman	Winery (Cider-press)	23	M	American.

TETANUS.

250	Laborer	Brick and Tile Works.	20	M	American.
214	Mason	Brick and Stone Works.	62	M	American.
014	Farmer (Dynamiting)	General Farm	66	M	American.
346	Finisher	Glass Works	23	M	American.
346	Finisher	Glass Works	24	M	American.
215	Contractor	Grading	?	M	American.
021	Farm Hand.	Home Farm	21	M	American.
021	Farm Hand.	Home Farm	34	M	American.
021	Farm Hand.	Home Farm	34	M	American.
833	Housekeeper	(Housekeeping)	31	M	American.
243	Laborer	Not designated	?	F	American.
			39	M	American.

BENZINE AND BENZOL POISONING.

370	Rubber Worker	(Automobiles)	44	M	American.
284	Laborer	Electrical Mfg.	41	M	American.
328	Painter	(Pump and Hay Tools)	58	M	American.

U. S. Census Symbol.	Occupation.	Industry.	Age.	Sex.	Nativity.
384	Dipper	DERMATITIS. Enamel and Tinware.....	19	F	American.
311	Machinist	BRASS POISONING. (Stove Mfg.)	27	M	American.
846	Presser	CHOROIDITIS. (Laundry)	39	F	American.
370	Rubber Worker	CARBON-DISULPHIDE POISONING. Automobile Factory	48	M	German.
311	Machinist	TRAUMATIC CONJUNCTIVITIS AND IRITIS. (Glass Works)	36	M	?
475	Tester (Reel).....	NEURITIS. (Fishing Tackle)	46	M	English.

TUBERCULOSIS.

U. S. Census Symbol.	Occupation.	Industry.	Habits and Hazards.	Home Conditions.	Age.	Sex.	Nativity.
370	Assembler	Automobile Factory	Changes of Temp.	Poor	42	M	American.
370	Lathe Hand	Automobile Factory	Dust	Good	20	M	American.
329	Painter	(Automobiles)	Lead Fumes	Fair	29	M	American.
329	Painter	(Automobiles)	Dust	Poor	29	M	American.
329	Polisher	(Automobiles)	Dust	?	39	M	Austrian.
329	Painter	(Automobiles)	Dust	Fair	34	M	German.
485	Upholsterer	(Automobiles)	*	Good	17	M	American.
213	Boiler Maker	(Boiler Shop)	Changes of Temp.	Good	24	M	Croatian.
622	Driver	(Brewery)	*	Good	39	M	American.
463	Broom Maker	(Brooms)	Dust	Fair	57	M	?
218	Carpenter and Builder.	(Building Construction) ..	Not designated	Fair	55	M	?
270	Laborer	Cabinet Factory	Dust	Fair	35	M	Hungarian.
217	Cabinet Maker	Cabinet Factory	Turpentine Fumes	Fair	28	M	Hungarian.
218	Carpenter	Cabinet Factory	Dust	Poor	35	M	Hungarian.
484	Tinner	Cabinet Factory	* Dust	Poor	33	M	Hungarian.
329	Varnisher	Cabinet Factory	Dust	Fair	56	M	Hungarian.
396	Wood Finisher	Cabinet Factory	Dust	Poor	21	M	Austrian.
202	Apprentice Machinist..	Car Shop	Dust, Changes of Temp.	Good	23	M	Croatian.
217	Cabinet Maker	Carriage Works	Dust	Fair	47	M	Hungarian.
328	Painter	Carriage Works	Dust	Good	30	M	?
259	Cleaner	Castings	Dust	?	32	M	?
328	Painter	(Chemical Works)	Dust	Poor	48	M	American.
944	Cigar Roller	Cigar Factory	Not designated	Fair	17	F	Hungarian.
463	Assembler	Clothing	Dust, Dye	Good	23	F	American.
482	Bushelman	Clothing	**	Good	47	F	American.
356	Presser	Clothing	Dust, Steam	Fair	28	M	German.
470	Seamstress	Clothing	Monotonous	Fair	21	F	American.
470	Sewer	Clothing	Dust, Variable Temp., *	?	37	F	?
470	Sewer	Clothing	Monotonous	?	23	F	American.
470	Sewing Mach. Oper....	Clothing	Not designated	Fair	27	M	Hebrew.

TUBERCULOSIS — Continued.

U. S. Census Symbol.	Occupation.	Industry.	Habits and Hazards.	Home Conditions.	Age.	Sex.	Nativity.
482	Tailor	Clothing	Not designated	Fair	46	M	Russian.
482	Tailor	Clothing	Dust	Good	35	F	German.
220	Cooper	Cooper Shop	Dust	Poor	36	M	Bohemian.
210	Baker	Crackers, cakes, etc.	Dust, Changes of Temp.	Poor	34	M	German.
210	Baker	Crackers, cakes, etc.	* Extreme Heat	Fair	48	M	German.
876	Cook	Dining Car	Not designated	?	18	M	American.
301	Bottle Washer	(Distillery)	Dampness	Fair	50	F	?
233	Fireman	(Dry Cleaning)	Intense Heat	Fair	47	M	German.
463	Ass't. Core Maker	Electrical Supplies	* Dust	Poor	53	M	Austrian.
460	Carbon Maker	Electrical Supplies	Dust	Fair	17	F	Roumanian.
460	Cutter	Electrical Supplies	Dust, Dampness	Poor	16	F	Irish.
284	Laborer	Electrical Supplies	Not designated	Fair	34	M	?
460	Wire Drawer	Electrical Supplies	Dust	Good	18	F	American.
374	Core Maker	Foundry	Dust, Odor of gas	Poor	21	M	English.
259	Laborer	Foundry	* Vent. poor	Fair	50	M	Hungarian.
374	Machine Hand	Foundry	Dust	Good	52	M	German.
374	Machine Hand	Foundry	Acid Fumes	Fair	27	M	American.
323	Molder	Foundry	* Dust, gas and steam.	Fair	32	M	Bohemian.
323	Molder	Foundry	Dust	Fair	34	M	Bohemian.
329	Painter	Foundry	Dust **	?	45	M	Austrian.
394	Machine Hand	Furniture Factory	* Dust	Fair	40	M	?
485	Upholsterer	Furniture Factory	Dust	Fair	20	M	?
877	House Man	Hotel	Not designated	Fair	68	M	American.
234	Ass't. Supt.	Iron Mfg.	Not designated	Good	53	M	German.
374	Bolt Threader	Iron Mfg.	Acid Fumes	Good	21	M	Italian.
374	Bolter	Iron Mfg.	Dust	Good	29	M	American.
374	Cleaner	Iron Mfg.	Acid Fumes	Fair	34	M	Croatian.
374	Cutter	Iron Mfg.	Changes of Temp.	Fair	37	M	American.
374	Finisher	Iron Mfg.	Not designated	Good	28	M	?
236	Furnace Man	Iron Mfg.	Excessive heat	Fair	27	M	Greiner.

374	Galvanizer	Iron Mfg.	Dust *	Poor	29	M	Hungarian.
282	Grinder	Iron Mfg.	Iron	Poor	35	M	Hungarian.
259	Laborer	Iron Mfg.	Fatigue	Fair	26	M	?
259	Laborer	Iron Mfg.	Dust	Poor	46	M	Hungarian.
327	Lacquering	(Iron Mfg.)	Varnish fumes	Fair	65	M	English.
374	Machine Hand	Iron Mfg.	**	Fair	41	M	?
374	Machine Hand	Iron Mfg.	Fatigue	?	20	M	Austrian.
374	Machine Hand	Iron Mfg.	Gas fumes, dust	Fair	30	M	Croatian.
374	Machine Hand	Iron Mfg.	* Dust, heat and smoke	Poor	26	M	Russian.
374	Machine Hand	Iron Mfg.	Dust, intense heat	Good	23	M	American.
374	Machine Hand	Iron Mfg.	Dust	Good	20	F	Hungarian.
374	Machine Hand	Iron Mfg.	Not designated	Poor	39	M	Hungarian.
374	Machine Hand	Iron Mfg.	Dust	Poor	24	M	Croatian.
374	Machine Hand	Iron Mfg.	Monotonous	Good	26	M	American.
374	Machine Hand	Iron Mfg.	Dust	Good	43	M	Hungarian.
230	Metal Polisher	Iron Mfg.	Not designated	?	33	M	American.
374	Press Hand	Iron Mfg.	Not designated	Poor	29	F	Greiner.
374	Riveter	Iron Mfg.	Dust	Fair	28	M	Croatian.
374	Solderer	Iron Mfg.	Dust and gas fumes	Fair	18	M	American.
374	Threader	Iron Mfg.	Dust	Poor	21	F	Polish.
371	Tracers	Iron Mfg.	Poor ventilation	Good	29	F	Hungarian.
702	Watchman	Iron Mfg.	Dust and acid fumes	Fair	34	M	Hungarian.
702	Watchman	Iron Mfg.	**	Fair	59	M	American.
443	Machine Hand	Iron Mfg.	Dust	Good	18	F	?
443	Tacker	Knitting Mill	Not designated	?	22	F	German.
846	Mangler	Laundry	Heat and dampness	Good	25	F	Routanian.
252	Laborer	Lime Works	Dust	Fair	46	M	American.
259	Laborer	Machine Shop	**	Good	19	M	American.
374	Machine Hand	(Machine Shop)	Not designated	Fair	30	M	Hungarian.
374	Shaper	(Machine Shop)	Dust	Poor	32	M	Hungarian.
348	Polisher	Marble & Stone Yard	** Dust	Good	59	M	German.
382	Gilder	(Mirrors)	Dust, fumes and smoke	Fair	37	M	?
640	Laborer	Paper House	*	Fair	24	M	?
400	Color Mixer	Paper Mill	Dust	Good	30	M	American.
349	Clay Maker	Pottery	** Dust	?	42	M	American.
349	Cup Maker	Pottery	Dust, heat extremes	?	37	M	American.
349	Decalcomania Worker	Pottery	Dampness	?	24	F	American.
349	Dish Maker	Pottery	Dust, heat extremes	?	24	M	American.
349	Potter	Pottery	Clay dust	?	22	M	American.

Physical Characteristics

U. S. Census Symbol	Occupation	Industry	Habits and Hazards	Health Condition	Age	Sex	Notes
349	Potter	Pottery	Clay dust	Good	30	M	American
349	Presser	Pottery	Dust, heat, extremes	Good	30	M	American
219	Printer	Printing (Type)	Acid fumes	Good	30	M	American
977	Clerk	(Railroad Office)	Not designated	Good	30	M	Polish
372	Car Repairer	Railroad (Steam)	Dust, smoke	Good	30	M	Polish
835	Janitor	(Residence)	Not designated	Good	30	M	Polish
876	Cook	(Restaurant)	Not designated	Good	30	M	Polish
876	Cook	(Restaurant)	Not designated	Good	30	M	Polish
640	Porter	(Restaurant)	Not designated	Good	30	M	Polish
888	Waiter	(Restaurant)	Not designated	Good	30	M	Polish
888	Waitress	(Restaurant)	Not designated	Good	30	M	Polish
462	Machine Hand	Rubber Works	Not designated	Good	30	M	Polish
462	Machine Hand	Rubber Works	Not designated	Good	30	M	Polish
259	Laborer	Sheet Metal Works	Not designated	Good	30	M	Polish
402	Inker	Shoe Factory	Not designated	Good	30	M	Polish
402	Liner	Shoe Factory	Not designated	Good	30	M	Polish
402	Sewer	Shoe Factory	Not designated	Good	30	M	Polish
402	Sewer	Shoe Factory	Not designated	Good	30	M	Polish
977	Cutter	(Soup Mfg)	Not designated	Good	30	M	Polish
371	Foreman of Laborers	(Steel and Wire Works)	Not designated	Good	30	M	Polish
284	Laborer	(Steel and Wire Works)	Not designated	Good	30	M	Polish
256	Laborer	Steel and Wire Works	Not designated	Good	30	M	Polish
256	Laborer	Steel and Wire Works	Not designated	Good	30	M	Polish
256	Laborer	Steel and Wire Works	Not designated	Good	30	M	Polish
256	Laborer	Steel and Wire Works	Not designated	Good	30	M	Polish
371	Machine Hand	Steel and Wire Works	Not designated	Good	30	M	Polish
371	Machine Hand	Steel and Wire Works	Not designated	Good	30	M	Polish
885	Rod Finisher	Steel and Wire Works	Dust, smoke and gas	Good	30	M	Polish

218	Carpenter	Storage Battery)	Dust	Good	27	M	Polish.
259	Laborer	Stove Mfg.	Dust	Fair	29	M	Slavish.
640	Porter	Store	Not designated	Fair	43	M	American.
542	Motorman	Street Ry.	Dust	Good	28	M	?
403	Machine Hand	Tannery	Dampness and foul odor.	Fair	26	M	American.
403	Tanner	(Tool Factory)	* Dampness	Fair	31	M	Roumanian.
312	Tool Maker	Tobacco Factory	Syphilitic, gas fumes	Fair	41	M	Finnish.
281	Laborer	Not designated	Dust	?	36	M	?
357	Shirt Maker	Not designated	Not designated	Poor	17	F	?
480	Stone Cutter	Not designated	Dust	?	?	M	?
999	Stenographer	Not designated	Not designated	?	23	F	Hebrew.

Key: * moderate use of alcohol; ** alcoholic.

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Division of Industrial Hygiene, Ohio State Board of Health.

(Continued from the November issue.)

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Continued.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Posi- tive.	Tenta- tive.	Probable Total.
Instruments (Scientific, etc.).....	Metal grinding	Lead poisoning	1	.....	+
	Soldering	Lead poisoning .....	.....	1	+
	Electroplating	Cyanide ulcers	1	.....	+
Iron and Steel Blast Furnaces....	Furnacing	Gas poisoning	8	.....	+
Iron and Steel Bolts, Screws, etc.	Various processes	Tuberculosis	8	.....	+
Iron and Steel Forgings.....	Various processes	Tuberculosis	3	.....	+
Iron and Steel Rolling Mills.....	Pickling	Acid caries of teeth	24	.....	+
	Painting	Benzine poisoning	3	.....	+
	Galvanizing	Cramps, (heat)	1	.....	+
	Furnacing, hot rolling.....	Gas poisoning	5	.....	+
	Furnacing, hot rolling.....	Heat prostration	1	.....	+
	Tinning	Lead poisoning	2	.....	+
	Hot processes	Rheumatism, Lumbago	1	4	(+) +
			1	.....	+

Junk	Galvanizing	Ulcers (sal ammoniac)	2	1	+
Laundry	Galvanizing	Zinc poisoning	1	1	+
Lead Bar, Pipes, Sheet, etc.	Various processes	Tuberculosis	4	1	+
Lead Oxides and Carbonates	Smelting	Lead poisoning	2	1	+
Leather, Tanned and Curried	Various processes	Tuberculosis	10	1	+
Lime Manufacturing	Washing	Flat-foot	18	3	+
	Various processes	Tuberculosis	36	1	+
	Various processes	Lead poisoning	1	1	+
	Enameling	Lead poisoning	1	1	+
	Grinding	Conjunctivitis	1	1	+
	Grinding	Dermatitis	4	1	+
	Slaking	Dermatitis	1	1	+
	Grinding	Dyspnea	2	1	+
	Gas producing	Gas poisoning	1	1	+
	Various processes	Tuberculosis	3	1	+
	Cutting, etc.	Bronchitis	2	1	+
	Surfacing	Calcicosis	1	1	+
	Surfacing	Conjunctivitis	1	1	+
	Surfacing	Dermatitis (oxalic acid)	1	1	+
	Various processes	Pharyngitis	5	1	+
	Various processes	Tuberculosis	1	1	+
	Various processes	Byssinosis	1	1	+
	Various processes	Tuberculosis	1	1	+
	Sanding	Bronchitis	1	1	+
	Assembling metal parts.	Lead poisoning	1	1	+
	Metal grinding	Siderosis	1	1	+
	Various processes	Tuberculosis	2	1	+
	Mixing ingredients	Dermatitis	3	1	+
	Various processes	Conjunctivitis	1	1	+
	Handling lead pipes.	Lead poisoning	1	1	+
	Manufacturing varnish	Benzene intoxication	4	1	+
	Cleaning with benzine.	Dermatitis (benzene)	2	1	+
	Manufacturing varnish	Eczema	2	1	+
	Filling containers	Lead poisoning	22	4	+
	Grinding, mixing	Lead poisoning	1	1	+
	Labeling containers	Lead poisoning	1	1	+
	Soldering	Tuberculosis	3	1	+
	Miscellaneous		1	1	+

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Continued.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Positive.	Tentative.	Probable Total.
Painting and Varnishing (Non-manufacturing)* Paper and Roofing Paper	House painting	Lead poisoning	21	.....	+
	Sizing with alum.	Dermatitis and rhinitis	1	.....	+
	Various processes	Rheumatism	1	.....	+
	Various processes	Tuberculosis	9	.....	+
	Enameling	Lead poisoning	4	4	+
	Decorating	Benzine poisoning	.....	1	+
	Glaze dipping	Bronchitis	1	.....	(+)
	Decorating and tinting.	Lead poisoning	3	8	+
	Fettling	Lead poisoning	1	.....	+
	Glaze dipping	Lead poisoning	23	10	+
Porcelain Enameled Iron Ware. Pottery	Glaze mixing.	Lead poisoning	4	4	+
	Glost kiln.	Lead poisoning	15	15	+
	Helping glaze dipper.	Lead poisoning	10	4	+
	figgering	Lead poisoning	.....	2	(+)
	Straining glaze.	Lead poisoning	1	.....	+
	Washing saggars.	Red lead poisoning	3	.....	+
	Not specified.	Lead poisoning	1	.....	+
	Clay mixing	Pneumoconiosis	1	.....	+
	Clay mixing	Rheumatism	1	.....	+
	Washing saggars.	Rheumatism	1	.....	+
Printing and Publishing.....	Various processes	Tuberculosis	4	8	+
	Linotyping	Lead poisoning	1	1	+
	Montyping	Lead poisoning	1	.....	+
	Montyping	Lead poisoning	1	.....	+

Rubber Goods	Printing	Lead poisoning	2	..	+	+
	Type setting	Lead poisoning	1	..	+	+
	Printing	Rhinitis	1	..	+	+
	Miscellaneous	Tuberculosis	9	..	+	+
	Compounding, Milling	Anilin poisoning	1	2	+	+
	Mixing mills	Antimony poisoning .....	..	1	+	+
	Calendering	Benzine, benzol poisoning .....	..	2	+	+
	Cement mixing	Benzine, benzol, CS ₂ poisoning .....	..	..	+	+
	Dipping molds	Benzine poisoning	2	..	+	+
	Making inner tubes	Benzine poisoning .....	..	2	+	+
	Specialty work	Benzine, benzol poisoning	6	1	+	+
	Tire building	Benzine poisoning	1	..	+	+
	Cold cure	CS ₂ , CCl ₄ , S, Cl ₂ poisoning	9	5	+	+
	Specialty work	Dermatitis	2	..	+	+
	Making inner tubes	Dermatitis (benzene) .....	..	..	+	+
	Cold cure	Dermatitis (CS ₂) .....	..	..	+	+
	Compounding	Lead poisoning	20	4	+	+
	Mixing mills	Lead poisoning	28	4	+	+
	Specialty work	Lead poisoning .....	..	1	+	+
Safes and Vaults	Various processes	Tuberculosis	4	1	+	+
	Polishing, buffing	Bronchitis .....	..	2	+	+
	Painting, Sanding	Lead poisoning	6	1	+	+
	Various processes	Tuberculosis	1	7	+	+
Scales and Balances	Painting	Lead poisoning .....	..	1	+	+
	Metal grinding	Siderosis	1	..	+	+
Shipbuilding and boats	Boiler making	Deafness	1	..	+	+
	Soldering	Lead poisoning	1	..	+	+
	Painting	Methyl alcohol poisoning	1	..	+	+
Signs and Advertising Novelties	Electroplating	Anemia, secondary	2	..	+	+
	Painting	Lead poisoning	1	..	+	+
	Various processes	Tuberculosis	1	..	+	+
Smelting and Refining	Metal refining	Lead poisoning	4	..	+	+
Soap	Cutting soap	Choryza	1	..	+	+
	Handling soap	Eczema	1	..	+	+
	Various processes	Tuberculosis	2	..	+	+

* Ten were deaths.

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Concluded.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Posi- tive.	Tenta- tive.	Probable Total.
Stereo and Electrotyping.....	Cast scrubbing.....	Benzine poisoning	1	.....	+
	Cast coating with graphite.....	Catarrh of resp. passages.....	1	.....	+
	Tending batteries.....	Eczema.....	2	.....	+
	Casting.....	Lead poisoning.....	1	.....	+
Stoves and Furnaces.....	Blackening.....	Benzine poisoning.....	.....	1	.....
	Metal cleaning.....	Dermatitis (naphtha).....	1	.....	+
	Soldering.....	Lead poisoning.....	8	.....	+
	Mounting, grinding.....	Siderosis.....	1	.....	+
Tobacco and Cigars.....	Various processes.....	Tuberculosis.....	7	1	+
	Various processes.....	Anemia.....	.....	.....	+
	Bunch breaking, rolling.....	Myopia.....	.....	.....	+
	Casing.....	Rheumatism.....	1	.....	+
Toys and Games.....	Packing, etc.....	Tobacco heart.....	2	.....	+
	Various processes.....	Tobacco poisoning.....	2	4	+
	Various processes.....	Tuberculosis.....	10	.....	+
	Brazing.....	Brass chills.....	1	.....	+
Wire (Works and Mills).....	Enameling.....	Dermatitis (naphtha).....	.....	.....	+
	Machine shopping.....	Lead poisoning.....	.....	1	+
	Brazing.....	Pruritus.....	.....	.....	+
	Painting.....	Benzine poisoning.....	1	.....	+
Wire (Works and Mills).....	General labor.....	Gas poisoning.....	1	.....	(+)
	General labor.....	Keratitis.....	1	.....	(+)
	Galvanizing.....	Lead poisoning.....	1	.....	(+)

Galvanizing	Lead, zinc poisoning	1	3	+
Painting	Lead poisoning	1	1	+
Stove tending	Lead poisoning	1	1	(+)
Various processes	Tuberculosis	19	.....	+
Wood working	Asthma, bronchitis	2	.....	+
Various processes	Tuberculosis	1	.....	+
Unknown processes	Lead poisoning	1	1	+
Unknown processes	"Other Occupational Poisons", (deaths)	8	-
Wood, Turned and Carved	Totals	1,204	211
Miscellaneous
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OF CASES—Continued.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Posi- tive.	Tenta- tive.	Probable Total.
Instruments (Scientific, etc.).....	Metal grinding	Lead poisoning	1	.....	+
	Soldering	Lead poisoning .....	.....	1	+
	Electroplating	Cyanide ulcers	1	.....	+
Iron and Steel Blast Furnaces...	Furnacing	Gas poisoning	3	.....	+
Iron and Steel Bolts, Screws, etc.	Various processes	Tuberculosis	8	.....	+
Iron and Steel Forgings.....	Various processes	Tuberculosis	3	.....	+
Iron and Steel Rolling Mills.....	Pickling	Acid caries of teeth	24	.....	+
	Painting	Benzene poisoning	3	.....	+
	Galvanizing	Brass chills	1	.....	+
	Furnacing, hot rolling.....	Cramps, (heat)	5	.....	+
	Furnacing, hot rolling.....	Gas poisoning	1	.....	+
	Furnacing, hot rolling.....	Heat prostration	2	.....	+
	Tinning	Lead poisoning	1	4	(+)
	Hot processes	Rheumatism, Lumbago	1	.....	+

Junk	Galvanizing	Ulcers (sal ammoniac)	2	1	+
	Galvanizing	Zinc poisoning	1	1	+
	Various processes	Tuberculosis	4	1	+
	Smelting	Lead poisoning	2	1	+
Laundering	Various processes	Tuberculosis	1	1	+
	Washing	Flat-foot	10	1	+
	Various processes	Tuberculosis	18	1	+
	Various processes	Lead poisoning	36	3	+
Lead Bar, Pipes, Sheet, etc.	Various processes	Lead poisoning	1	1	+
	Enameling	Lead poisoning	1	1	+
	Grinding	Conjunctivitis	4	1	+
	Grinding	Dermatitis	2	1	+
Lead Oxides and Carbonates	Slaking	Dermatitis	1	1	+
	Grinding	Dyspnea	1	1	+
	Gas producing	Gas poisoning	1	1	+
	Various processes	Tuberculosis	3	1	+
Liquors, Malt	Cutting	Bronchitis	2	1	+
	Cutting, etc.	Calcosis	1	1	+
	Surfacing	Conjunctivitis	1	1	+
	Surfacing	Dermatitis (oxalic acid)	1	1	+
Marble and Stone	Surfacing	Pharyngitis	1	1	+
	Various processes	Tuberculosis	5	1	+
	Various processes	Byssinosis	1	4	+
	Various processes	Tuberculosis	1	1	+
Mattresses	Sanding	Bronchitis	1	1	+
	Assembling metal parts	Lead poisoning	1	1	+
	Metal grinding	Siderosis	2	2	+
	Various processes	Tuberculosis	1	1	+
Musical Instruments	Mixing ingredients	Dermatitis	8	1	+
	Various processes	Conjunctivitis	1	1	+
	Handling lead pipes	Lead poisoning	1	1	+
	Manufacturing varnish	Benzine intoxication	4	1	+
Oil Cloth and Linoleum	Cleaning with benzine	Dermatitis (benzene)	2	1	+
	Manufacturing varnish	Eczema	2	2	+
	Filling containers	Lead poisoning	22	4	+
	Grinding, mixing	Lead poisoning	1	1	+
Paint and Varnish (Mfg.)	Labeling containers	Lead poisoning	1	1	+
	Soldering	Lead poisoning	1	1	+
	Miscellaneous	Tuberculosis	1	1	+

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Continued.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Positive.	Tentative.	Probable Total.
Painting and Varnishing (Non-manufacturing)* Paper and Roofing Paper.....	House painting	Lead poisoning	21	.....	++
	Sizing with alum	Dermatitis and rhinitis	1	.....	++
	Various processes	Rheumatism	1	.....	++
	Enameling	Tuberculosis	9	.....	++
	Decorating	Lead poisoning	4	4	++
	Glaze dipping	Benzine poisoning .....	.....	1	+
	Decorating and tinting	Bronchitis	1	.....	(+)
	Fettling	Lead poisoning	8	3	++
	Glaze dipping	Lead poisoning	1	.....	++
	Glaze mixing	Lead poisoning	23	10	++
Porcelain Enameled Iron Ware. Pottery	Glaze dipping	Lead poisoning	4	4	++
	Glost kiln	Lead poisoning	15	15	++
	Helping glaze dipper	Lead poisoning	10	4	++
	liggering	Lead poisoning .....	.....	2	(+)
	Straining glaze	Lead poisoning	1	.....	++
	Washing saggars	Red lead poisoning	3	.....	++
	Not specified	Lead poisoning	1	.....	++
	Clay mixing	Pneumoconiosis	1	.....	++
	Clay mixing	Rheumatism	1	.....	++
	Washing saggars	Rheumatism	1	.....	++
Printing and Publishing.....	Various processes	Tuberculosis	4	.....	++
	Linotyping	Lead poisoning	1	8	++
	Montyping	Lead poisoning	1	1	++

Rubber Goods	Printing	Lead poisoning	2	.....	+
.....	Type setting	Lead poisoning	1	.....	+
.....	Printing	Rhinitis	1	.....	+
.....	Miscellaneous	Tuberculosis	9	.....	+
.....	Compounding, Milling	Anilin poisoning	1	.....	+
.....	Mixing mills	Antimony poisoning	2	.....	(+)
.....	Calendering	Benzene, benzol poisoning	1	.....	(+)
.....	Cement mixing	Benzene, benzol, CS, poisoning	2	.....	+
.....	Dipping molds	Benzene poisoning	2	.....	+
.....	Making inner tubes	Benzene poisoning	6	.....	+
.....	Specialty work	Benzene, benzol poisoning	1	.....	+
.....	Tire building	Benzene poisoning	9	.....	+
.....	Cold cure	CS, CCl ₄ , S, Cl ₂ poisoning	2	.....	+
.....	Specialty work	Dermatitis .....	.....	.....	+
.....	Making inner tubes	Dermatitis (benzene) .....	.....	.....	+
.....	Cold cure	Dermatitis (CS ₂) .....	.....	.....	+
.....	Compounding	Lead poisoning	20	.....	++
.....	Mixing mills	Lead poisoning	23	.....	++
.....	Specialty work	Lead poisoning	4	.....	(+)
.....	Various processes	Tuberculosis .....	.....	.....	+
.....	Polishing, buffing	Bronchitis	1	.....	+
.....	Painting, Sanding	Lead poisoning	2	.....	+
.....	Various processes	Tuberculosis	1	.....	+
.....	Painting	Lead poisoning	6	.....	+
.....	Metal grinding	Siderosis	1	.....	+
.....	Boiler making	Deafness	1	.....	+
.....	Soldering	Lead poisoning	1	.....	+
.....	Painting	Methyl alcohol poisoning	1	.....	+
.....	Electroplating	Anemia, secondary	2	.....	+
.....	Painting	Lead poisoning	1	.....	+
.....	Various processes	Tuberculosis	1	.....	+
.....	Metal reining	Lead poisoning	4	.....	++
.....	Cutting soap	Chorvza	1	.....	+
.....	Handling soap	Eczema	1	.....	+
.....	Various processes	Tuberculosis	2	.....	+

* Ten were deaths.

TABULATION OF OCCUPATIONAL DISEASES AND DISABILITIES BY INDUSTRIES, TRADE PROCESSES, TYPES AND NUMBERS
OF CASES—Concluded.

Industry.	Trade process from which cases of disease or disability were reported.	Diseases or disability reported.	Number of reported cases of diseases or disability by type of case.		
			Posi- tive.	Tenta- tive.	Probable Total.
Stereo and Electrotyping.....	Cast scrubbing.....	Benzine poisoning	1	.....	+
	Cast coating with graphite....	Catarrh of resp. passages.....	1	.....	+
	Tending batteries.....	Eczema	2	.....	+
	Casting	Lead poisoning	1	.....	+
Stoves and Furnaces.....	Blackening	Benzine poisoning .....	.....	1	.....
	Metal cleaning.....	Dermatitis (naphtha)	1	.....	+
	Soldering	Lead poisoning	8	.....	+
	Mounting, grinding.....	Siderosis	1	.....	+
Tobacco and Cigars.....	Various processes.....	Tuberculosis	7	1	+
	Various processes.....	Anemia .....	.....	.....	+
	Bunch breaking, rolling.....	Myopia .....	.....	.....	+
	Casing	Rheumatism	1	.....	+
Toys and Games.....	Packing, etc.....	Tobacco heart	2	.....	+
	Various processes.....	Tobacco poisoning	2	4	+
	Various processes.....	Tuberculosis	10	.....	+
	Brazing	Brass chills	1	.....	+
Wire (Works and Mills).....	Enameling	Dermatitis (naphtha) .....	.....	.....	+
	Machine shopping.....	Lead poisoning .....	.....	1	.....
	Brazing	Pruritus .....	.....	1	.....
	Painting	Benzine poisoning	1	.....	+
Wire (Works and Mills).....	General labor.....	Gas poisoning	1	.....	(+)
	Galvanizing	Keratitis	1	.....	(+)
	.....	Lead poisoning	1	.....	(+)

Wood, Turned and Carved.....	Galvanizing	Lead, zinc poisoning.....	.....	3	+
Miscellaneous	Painting	Lead poisoning	1	1	+
Miscellaneous	Stove tending.....	Lead poisoning	1	.....	(+)
	Various processes.....	Tuberculosis	19	.....	+
	Wood working.....	Asthma, bronchitis	2	.....	+
	Various processes.....	Tuberculosis	1	1	+
	Unknown processes.....	Lead poisoning	1	.....	+
	Unknown processes.....	"Other Occupational Poisons", (deaths)	8	.....	-
		Totals	1,204	211	.....

ALPHABETICAL LIST OF OCCUPATIONAL DISEASES AND DISABILITIES
SHOWING TYPES AND NUMBERS OF CASES.

Disease or Disability.	Number of reported cases of disease or disability by type of case.	
	Positive.	Tentative.
Acid caries of teeth.....	24	.....
Alcohol (methyl) poisoning.....	6	.....
Amyl acetate poisoning.....	1	1
Anemia (painting, lacquering).....	3	.....
Anilin poisoning.....	1	2
Anthraxis.....	1	1
Antimony poisoning.....	1	2
Appendicitis.....	1	3
Benzine, benzol poisoning.....	33	14
Blind spells (light).....	1	.....
Brass chills.....	117	3
Brass itch.....	7	.....
Bronchitis, asthma, catarrh.....	16	2
Burns (zinc chloride).....	2	.....
Bursitis (olecranon).....	1	.....
Byssinosis.....	.....	1
Calcicosis.....	1	.....
Compressed air illness.....	1	.....
Conjunctivitis, blepharitis.....	9	.....
Cramps (heat).....	5	.....
CS ₂ , Cl ₂ , S ₂ Cl ₂ poisoning.....	9	5
Cyanide ulcers.....	1	.....
Deafness.....	2	.....
Dermatitis, eczema, pruritus, ulcers.....	39	3
Dyspnea.....	2	.....
Enamel fume poisoning.....	.....	1
Epistaxis (nose bleed).....	2	.....
Eye-strain (welding).....	1	.....
Flat foot.....	1	.....
Fume poisoning.....	2	1
Gas poisoning.....	12	1
Glue fume(?) intoxication.....	1	.....
Heat prostrations.....	2	.....
Hydrofluoric acid poisoning.....	1	.....
Keratitis (wire mill).....	1	.....
Lead poisoning.....	544	138
Nitroglycerine poisoning.....	.....	3
Occupational neuritis.....	2	.....
Occupational neurosis.....	4	1
Pharyngitis.....	1	.....
Pneumonokoniosis.....	2	.....
Rheumatism.....	7	1
Rhinitis, choryza.....	9	.....
Siderosis.....	13	1
Tobacco heart.....	2	.....
Tobacco poisoning.....	2	4

ALPHABETICAL LIST OF OCCUPATIONAL DISEASES AND DISABILITIES
SHOWING TYPES AND NUMBER OF CASES. — CONCLUDED.

Disease or Disability.	Number of reported cases of disease or disability by type of case.	
	tive. Posi-	tive. Tenta-
Tuberculosis	301	21
Turpentine poisoning	2	2
Zinc chills	3	1
Other occupational poisonings.....	8	.....
Total	1,204	211

OCCUPATIONAL LEAD POISONING BY INDUSTRIES AND TRADE PROCESSES.

Industry.	Trade Processes.	Number of reported cases of disease or disability by type of case.	
		Posi-tive.	Tenta-tive.
Agricultural Implements.....	Painting, bronzing	4	1
Automobiles and Parts.....	Carpentering on primed work; painting, sanding, etc.; tempering; not specified	79	6
Babbittin ^g Metals and Solder.	Melting (soft metals)	1	1
Bicycles, Sewing Mach., etc...	Painting, varnishing.....	2	.....
Brass and Bronze Products...	Founding, soldering.....	3	2
Carriages, Wagons and Parts.	Painting, sanding.....	42	13
Cars and Repairs (by railroads)	Carpentering on primed work; painting; varnishing; soldering	3	3
Cars and Repairs (not by roads)	Painting, varnishing.....	6	1
Cash Registers and Calc. Mach.	Tempering	2	.....
Chemicals	Lead burning, ore crushing...	6	.....
Coffins, Vaults, etc.....	Brass and lead founding: painting, varnishing; polishing, buffing; soldering.....	13	4
Copper, Tin, etc.....	Machine shopping; soldering.	3	.....
Cutlery and Tools.....	Tempering	7	1
Elec. Appar., etc.....	Lead burning, storage batteries, soldering	107	10

**OCCUPATIONAL LEAD POISONING BY INDUSTRIES AND TRADE
Processes—Continued.**

Industry.	Trade Processes.	Number of reported cases of disease or disability by type of case.	
		Positive.	Tentative.
Emery Wheels	Babbitting, molding.....		2
Enameling and Japanning.....	Enameling	3	3
Explosives	Lead founding.....		1
Files	File cutting, tempering.....	3	
Flags, Regalia, etc.....	Painting	1	
Foundry and Mach. Shop Products	Die casting, founding, painting, soldering, tempering.....	4	10
Furniture and Cabinets.....	Painting, varnishing.....	6	1
Glass Cutting, Staining, Art..	Painting, assembling.....		1
Glass Mfg.	Lead putty making, mixing ingredients	6	
Instruments (scientific).....	Metal grinding, soldering.....	1	1
Junk	Smelting		1
Iron and Steel Rolling Mills..	Tinning	1	4
Lead Bar, Pipes, Sheets, etc..	Various processes.....	18	1
Lead Oxides and Carbonates..	Various processes.....	36	3
Leather, Tanned and Curried..	Enameling		1
Musical Instruments.....	Assembling metal parts.....		1
Oil Refining	Handling lead pipes.....	1	
Paint and Varnish (Mfg.)....	Grinding, mixing, filling containers, soldering, labeling..	25	7
Painting and Varnishing (Non-mfg.)*	House painting.....	21	
Porcelain Enameled Iron Ware	Enameling	4	4
Pottery	Glaze mixing, glaze dipping, straining glaze, wash-saggers, glost kilns, fettling, decorating and tinting (jiggering), not specified..	61	38
Printing and Publishing.....	Linotyping, monotyping, printing, typesetting.....	5	1
Rubber Goods.....	Compounding, mixing mills, specialty work.....	43	0
Safes and Vaults.....	Painting, sanding.....	6	1
Scales and Balances.....	Painting	7	1
Shipbuilding and Boats.....	Soldering	1	
Signs and Adv. Novelties.....	Painting	1	
Smelting and Refining.....	Metal refining.....	4	
Stereo and Electroplating.....	Casting	1	
Stoves and Furnaces.....	Soldering	3	
Toys and Games.....	Machine shopping.....		1
Wire (Works and Mills).....	Galvanizing, painting, stove tending	3	4
Miscellaneous	Unknown	1	
Total Lead Poisoning cases		544	138

* Ten were deaths.

OCCUPATIONAL DERMATITIS (AND ECZEMA, PURITUS, ULCERS) BY INDUSTRIES AND TRADE PROCESSES.

Industry.	Trade Processes.	Number of reported cases of disease or disability by type of case.	
		Positive.	Tentative.
Automobiles and Parts.....	Machine shopping (oil).....	1	.....
Boots and Shoes.....	Closing, blackening.....	2	.....
Boxes, Fancy and Paper.....	Paper box making (glue).....	1	.....
Brass and Bronze Products.....	Acid dipping.....	1	.....
Clothing and Textiles.....	Cleaning, dyeing.....	1	.....
Cordage, Twine, Jute.....	Combing, stranding (oil).....	2	.....
Dry Cleaning and Dyeing.....	Dyeing, cleaning.....	1	.....
Elec. Appar., etc.....	Pitching dry batteries.....	3	.....
Enameling and Japanning.....	Enameling.....	1	.....
Foundry and Mach. Shop Products.....	Welding, electroplating.....	3	.....
Furniture and Cabinets.....	Polishing, veneering.....	5	.....
Glass Mfg.	Mixing ingredients (arsenic), decorating (benzine).....	2	1
Iron and Steel Mills.....	Galvanizing (sal ammoniac).....	2	.....
Lime Mfg.....	Grinding, slaking.....	5	.....
Marble & Stone.....	Surfacing (oxalic acid).....	1	.....
Oil Cloth and Linoleum.....	Mixing ingredients.....	.....	1
Paint and Varnish Mfg.....	Cleaning with benzine, mfg. varnish.....	3	.....
Paper and Roofing Paper.....	Sizing with alum.....	1	.....
Rubber Goods.....	Specialty work, making inner tubes, cold cure.....	2	.....
Soap.....	Handling soap.....	1	.....
Stereo- and Electrotyping.....	Tending batteries.....	2	.....
Stoves and Furnaces.....	Metal cleaning (naphtha).....	1	.....
Toys and Games.....	Brazing.....	.....	1
	Total Dermatitis Cases....	41	3

OCCUPATIONAL BENZINE AND BENZOL POISONING BY INDUSTRIES AND TRADE PROCESSES.

Industry.	Trade Processes.	Number of reported cases of disease or disability by type of case.	
		tive. Posi-	tive. Tenta-
Agricultural Implements.....	Painting, enameling.....	3	.....
Boots and Shoes.....	Cementing, finishing.....	2	.....
Brass and Bronze Products...	Painting, varnishing, etc.....		2
Dry Cleaning and Dyeing.....	Dyeing, cleaning.....	7	1
Explosives	Enameling	2	.....
Furniture and Cabinets.....	Shellacing, varnishing	1	4
Iron & Steel Mills.....	Painting	3	.....
Paint and Varnish (Mfg.)....	Mfg. varnish.....	4	.....
Pottery	Decorating		1
Rubber	Calendering, cement mixing, dipping molds, making inner tubes, specialty work, tire building.....	9	5
Stereo- and Electroplating....	Cast scrubbing.....	1	.....
Stoves and Furnaces.....	Blackening		1
Wire (Works and Mills).....	Painting	1	.....
	Total	33	14

OCCUPATIONAL BRASS POISONING BY INDUSTRIES AND TRADE PROCESSES.

Industry.	Trade Processes.	Number of reported cases of disease or disability by type of case.	
		Positive.	Tentative.
Bicycles, Sewing Mach., etc...	Brazing, molding.....	7	.....
Brass and Bronze Products...	Brass founding, buffing, polishing.....	80	.....
Cars and Repairs (by rail-roads).....	Brass founding.....	10	.....
Cash Registers and Calc. Mach.	Brass founding.....	10	.....
Electric Appar., etc.....	Brass founding.....	12	.....
Foundry and Mach. Shop Products.....	Brass founding.....	3	1
Galvanizing.....	Galvanizing.....	.....	1
Iron and Steel Mills.....	Galvanizing.....	1	.....
Toys and Games.....	Brazing.....	1	.....
	Total.....	124	2

Large placards of the form below will be supplied to manufacturers upon request.

NOTICE.

INSTRUCTIONS TO EMPLOYEES.

HOW TO PREVENT LEAD POISONING.

- (1) All workers exposed to *lead dusts, lead fumes, lead solutions and lead compounds* are liable to *poisoning*. These poisons get into the body through the *nose* while breathing, or through the *mouth* when chewing, or swallowing, or wetting the lips.
- (2) Do all you can to *keep down dust*. When sweeping or cleaning, always dampen with water, oil or wet sawdust. Where dust can not be kept down, you must *wear a respirator*. This must be cleaned out at least once a day.
- (3) *Eat breakfast before going to work*. Drink milk at meals, and if possible once between meals. *Do not eat meals in workroom*. Leave work-room at meal times.
- (4) Keep *dirty fingers* out of your mouth, and off of your food, and whatever goes into your mouth. *Wash hands, arms and face* with warm water and soap before eating, going to the toilet, or quitting the work-room. Clean your lips and rinse out your mouth before eating or drinking.
- (5) A *mustache*, if worn, must be kept short. Do not wear a *beard*. Keep *fingernails* clean and cut short, also loose skin about the nails or hands.

- (6) Do not chew *tobacco* or *gum* while at work. Avoid the use of intoxicants in any form, as they promote lead poisoning.
- (7) Take a *full bath* with warm water and soap at least *twice a week*.
- (8) You must wear *overalls* and *jumpers* while at work. Wear a cap if exposed to dust or fumes. Do not wear your working clothes outside of the working place.
- (9) Keep your bowels moving if possible once a day. Report to your foreman if you notice (1) loss of appetite, (2) poor sleep, (3) indigestion, (4) continual constipation, (5) vomiting, (6) pains in stomach, (7) dizziness, (8) continual headache, or (9) weakness in arms, limbs or body.

NOTE: Lead poisoning brings on Paralysis of the wrists and arms, hardens the arteries, causes chronic diseases, and hastens old age and death. **WORKMAN PROTECT YOURSELF.** Your employer and the Board of Health cannot do all for you. **OBSERVE THE ABOVE PRECAUTIONS.**

OHIO STATE BOARD OF HEALTH,

Columbus, Ohio.

DR. E. F. McCAMPBELL,
Secretary and Executive Officer.

PART VIII.

MEASURES OF PREVENTION.

THE GENERAL PRINCIPLES OF THE PREVENTION OF OCCUPATIONAL DISEASES.

Plainly, the prevention of occupational diseases lies in the elimination of health-hazards from industry.

At once it must be understood that occupational diseases are not necessarily extrinsic poisonings, such as lead, benzine, etc., but are just as much the result of intrinsic poisonings and toxins, which have been generated within the system through fatigue, inactivity, temperature variations, dampness and disease. It is, however, well to consider the cases of extrinsic poisoning as *specific* occupational diseases, and the cases of intrinsic poisonings as *non-specific* occupational diseases, since the health-hazards which produce this latter group are, oftentimes, extant outside of industry, because of various moral delinquencies, domestic habits, etc.; but the moiety which industry causes in these non-specific occupational diseases should not be over-looked, as is now so commonly done and which results in charging all such disasters to factors outside of industry.

"In order to improve the hygienic conditions under which people work, and in order to prevent the diseases of occupation, five fundamental conditions are essential: (1) investigations; (2) laws; (3) factory inspection; (4)

penalties; (5) education. It is self-evident that before anything may be accomplished a careful study must be made of the facts. These investigations must include not only scientific studies, but also economic and sociological factors. Suitable laws are necessary, for it has been found in practice that the conditions cannot be corrected by an appeal to voluntary reform. To be effective the laws must provide ample ways and means for their energetic enforcement. A systematic factory inspection is necessary in order not only to protect work-people against the preventable diseases of occupation and to correct sanitary defects, but also to enforce the laws concerning hours of occupation, child labor laws, and related subjects. These laws have little force unless they provide a penalty both against the employer and the employees. Either party to the contract should be held legally responsible in case of violation. Finally, education directed to the employer, the employee, and also to the public at large is necessary to obtain the laws and maintain the standards."—(*Rosenau. Preventive Medicine and Hygiene*, 1913, Page 915.)

Principle I.—If it is hazardous to human lives to produce an article of human usefulness, then the cost of production should include the cost of the conservation of health.

Principle II.—A proper place to work, and safe methods of working, and some knowledge of the dangers to health and life are pre-requisites to conducting any business, or to working, no matter whether one man or a thousand are concerned, and whether the individual is an employer or an employee.

Principle III.—The health of the individual is an affair of the State, since his dependency, wilful or otherwise, becomes a burden upon the State, directly or indirectly.

It seems at this time impossible to prevent occupational diseases by specific legislation; for, the mass of statutes necessary to enact to cover each particular process, and to keep up with the progress of industries and processes, would seem practically incapable of accomplishment. On the other hand, we believe that the entire question can be handled by means of rules embodying instructions and explanations of reasonable and feasible character, created for all the industries of the state by the offices of the State Board of Health, and of such a character that though left to the enforcement of the Industrial Commission of Ohio, they will practically enforce themselves through the common acquiescence of employers and employees, and the extension of the principles of compensation to occupational diseases.

The question of how to compensate for non-specific occupational diseases, such, for instance, as tuberculosis which may be due to several factors other than work conditions, has been solved abroad as follows: If the workman at or before the time of disablement was employed in any process mentioned in the schedule (of health-haz-

ardous processes) and the disease contracted is the disease set opposite to the description of that process (in the schedule), the disease shall be deemed to have been due to the nature of that employment unless the contrary is proved.

Attention is called to what is known as the Overlock Tuberculosis Agreement which is in vogue in the New England States and has been adopted by various chambers of commerce, manufacturers' associations, and individual establishments. The Agreement provides a simple method by which this scourge of humanity can be driven from the factory districts where it now chiefly flourishes. In short, the proposition is that the manufacturer or employer pay for the sanatorium treatment of any of his employes who are so unfortunate as to be stricken with this disease. In Massachusetts, where the movement began, the Rutland Sanatorium is able to treat such cases for \$4.00 a week. The first manufacturer to make the agreement did so in 1908, in the case of a working girl, whose expenses he offered to pay at the sanatorium "for a period of 3 months or longer if necessary." It is claimed that the Agreement now embraces more than 1,200 mercantile and manufacturing establishments, employing approximately 2,000,000 people in the New England States, where it is driving this plague from industry. Before it could be fully adopted in Ohio, more sanatoriums must be provided. As stated before, there are some 35,000 cases of the disease in the state. How many of these are in industry it is impossible to estimate.

CORRECTIVE MEASURES RECOMMENDED.

Under each general process and special process described in Part V. are given specific suggestions to meet the hazardous conditions described. We will conclude by giving some general statements.

The corrective measures to be recommended fall under three heads: (1) Information, education and publicity, (2) correlation of industrial health-hazards and occupational diseases, and (3) co-operative legislation.

(1) The supplying of information to the employers of labor in different industries and trade processes upon the forms of health-hazards which have been found to exist in such industries and processes, and the types of occupational diseases and disabilities, the prevalence of tuberculosis and other chronic diseases—all of these are important functions of the state and local health body, and are essential in the elimination of much preventable disease. Along with such information should be supplied an outline of corrective measures

which are based upon reasonableness, practicability and economy, and which have been culled from various sources everywhere. The mechanical problems of various installations and devices are, of course, outside of the field of the health officer.

The carrying home to the workers themselves of the fundamental principles of hygiene is very important. Our investigation has shown many instances of entirely wrong conceptions of hygiene which serious-minded workers have advocated. It is usually possible to apply these principles of hygiene directly to the industries and trade processes in question. There is no question that much of the preventable disease rate among occupied persons, perhaps over half of it, is due to the ignorance or misinformation, or sheer non-interest-*edness* of the workers themselves. For poisonous trades and the principal dusty occupations, as well as most of the dozen health-hazards commonly met with, placard of instructions on the avoidance of such hazards, such as the two simple forms given in the preceding Part can be posted up in work quarters, and arrangements made for their interpretation into the various foreign languages, and their reading at intervals as a definite plan of the factory efficiency. These would help considerably. More important, however, than these is the arrangement for a careful instruction of foremen and overseers in the questions as evolved at each plant. This can be arranged for usually through the local health department, which, if it is not in a position to devote time to this itself, can recommend properly qualified persons, usually physicians (but at least persons skilled in hygiene), to give brief talks at short meetings, and to co-operate by taking observations throughout the work place. Already, today, this plan has been extended, not only to the skilled, but to the unskilled workers in a number of plants in the state, whereby once or twice a month fifteen minutes or so at noon time is taken for a short crisp talk by a properly qualified person upon the questions of hygiene at hand, and the problems which the workers should meet to increase their own efficiency and their own productiveness.

The general public itself is, as a rule, quite indefinitely informed on the principles of "preventive medicine" and hygiene, including industrial hygiene. As practically all adults have to work, it is important that each individual should become acquainted with the health-hazards of his particular calling, for most of which civilization has introduced more or less artificiality, which is not in keeping with the physiological or normal functions of the human being. Publicity through health agents, public health exhibits, lectures, etc., and the preparedness of health agencies to supply the information desired, are the general means of covering this field.

(2) There is greatly needed today a real correlation of occupational diseases and disabilities with industrial malhygiene by treating agencies and institutions, which should adopt forms and means of reporting these correlations to local or state health officials. There is unquestionably a great shortcoming in this direction, which is productive of enormous economic waste. These treating agencies, many of them maintained by the public itself, or by charitable institutions, go through their routine of furnishing aid and succor day after day, without themselves trying to connect up these remnants of social delinquencies with the causes which produced them, nor is the information which they collect recorded in an available form for utilization by corrective agencies. To explain this situation more fully as well as to emphasize corrective measures, the following summary is taken from a recent article by the director of the survey.

THE PREVALENCE OF OCCUPATIONAL FACTORS IN DISEASE, AND
SUGGESTIONS FOR THEIR ELIMINATION.*

E. R. HAYHURST.

The purpose of this paper is, first, to point out the socially wasteful practice of administering daily to person after person for the same types of morbidity, due to the same causes, and, secondly, to emphasize a much neglected sphere of etiology, the proper conception of which is contained in the term "industrial relations."

The research summarizes a study of (1) U. S. Census Mortality Statistics of Occupations; (2) 65,000 dispensary records and many hundreds of cases personally seen during a two-year period at Rush Medical College (Central Free Dispensary); and (3) the medical portion of 27,887 cases in which the patients received treatment in Cook County Hospital during the year 1913.

As a result of considerable study of hospital and dispensary cases and records, of vital statistics, and of field investigations, we reach the following conclusions:

SUGGESTIONS FOR THE SOLUTION OF THE PROBLEM OF OCCUPATIONAL DISEASES.

The health-hazards of industry which cannot be feasibly removed are insignificant in number. The best proof is the fact that certain establishments engaged in the industries and processes in question have circumvented such hazards, and invariably to the improvement of production, as well as labor attitude and relations.

*Results of a study conducted at the Central Free Dispensary (Rush Medical College) and Cook County Hospital, Chicago, under the Occupational Disease Fellowship of the Otho S. A. Sprague Memorial Institute for Infectious Diseases.—Abstracted from article in *Jour. Amer. Med. Asso.*, Dec. 12, 1914, p. 2093-2097.

1. Occupied persons, other than agriculturists, suffer an enormous mortality (figures show 74 per cent.) from well-recognized preventable and prematurely degenerative diseases.

2. Occupational diseases exist because industrial health-hazards exist. Responsible employers do not realize the existence of either, while treating agencies take little cognizance of employments.

It must not be forgotten that patients themselves are densely ignorant of what constitute health-hazards; that they calmly accept them as a matter of course, and unworthy of notice; that the competition for work is great; and (one comes to realize) so much greater than everything else is *the innate desire in man to work*, especially before middle life—a desire which, in the normal man, equals his appetite and seeks to be satisfied in spite of all conditions.

3. From one-fourth to one-third of the medical afflictions of tradespersons are due in whole, or in great part, to industrial health-hazards.

4. In institutions, the vast majority of industrial diseases are lost sight of through failure to recognize properly the industrial relations of the patients, to make etiologic diagnoses, and to classify properly in subsequent filing.

A principal feature in all these cases is to determine exactly the occupations. The principal result should be an etiologic diagnosis as far as possible, including the use of qualifying terms such as "bronchitis, occupational," "neuritis, chiefly occupational," "aortic aneurysm, probably occupational," "nephritis—alcoholic and lead," etc. This is similar to uses elsewhere, as seen in such descriptive terms as *puerperal sepsis*, *tuberculous pneumonia*, *typhoid fever* and *diabetes mellitus*.

During the course of the year 1913, there were in the hospital *2,230 adult cases of tuberculosis* (I understand that not over 50 of there were "repeats"), 1,800 males and 430 females. One may safely say that practically none of these had active tuberculosis at the age of 14 years! The question is, Why and how have they acquired it since? How many of them would have it now had they lived an agrarian existence, for instance?

5. Specific occupational diseases, such as lead poisoning, are not recognized in more than one out of three or four instances, more especially the chronic cases.

Present-day institutional records are of value only in showing the enormous numbers of representatives of groups of industrial pursuits who are below the physiologic normal, and who seek medical aid for preventable afflictions. Such records have little value to the student of economics. For instance no cases were recorded of *pneumoconiosis*, or of its various forms, as *siderosis*, *chalicosis*, *aluminosis*, etc., although there were a total of 134 cases of *chronic bronchitis* without efforts at etiologic diagnosis.

There were recorded 229 cases of *arteriosclerosis*. Unfortunately an idea of the extent to which fatigue-substances, heat-toxins and extrinsic poisons of industrial origin may have entered into this class of cases can rarely be gained from present-day histories anywhere; hence any idea of using the information for shutting off the oncome of such cases is at once precluded. They are all charged apparently to the account of moral hazards, or disease misfortunes.

7. A most important first remedy is a proper nomenclature for industrial relations to take the place of the word "occupation." Such a nomenclature is here propounded.

TABLE 5.—SCHEME TO TAKE THE PLACE OF THE WORD "OCCUPATION."

INDUSTRIAL RELATIONS			
<i>(As stated by the Patient)</i>			
	<i>Present</i>	<i>Past</i>	<i>Previous (to Past)*</i>
1. Name of employer.....
2. Address of employer.....
3. Business of employer.....
4. Calendar years worked here.....
5. Department(s) worked in.....
6. Particular process(es) engaged in.....
7. Health-hazards† exposed to.....

The chief feature of this is the introduction of the term "industry-department-process" for the word "occupation."

TABLE 6.—EXAMPLES OF THE COMPLETE STATEMENT FOR "OCCUPATION."

<i>Industry</i>	<i>Business Dept.</i>	<i>Trade Process</i>
Agricultural implements	Clay shop	Jiggerman
Brass	Glaze room	Dipper's helper
Iron and steel	Painting	Painter and sander
Vehicle	Painting	Dipping machine laborer
Pottery	Butt mill	Furnaceman
Pottery	Foundry	Furnaceman
Iron foundry	Foundry	Laborer
General	Nondescript	Laborer

In this way it is possible to classify any one's trade or calling exactly. As in the case of "iron foundry," redundancies seemingly occur, but these are only apparent, for all the information obtained is necessary to exactly identify each worker's industrial application and environment. Adoption of this proposed term, furthermore, renders a logical classification of occupations possible. No such classification now exists.

8. In spite of the fact that the state in which this study was made (Illinois) has an occupational disease law, workers are still coming into its charitable institutions from the same types of trades, and in some instances, from the same manufacturing establishments, in even greater numbers than at a period three years previous, when the Illinois Commission on Occupational Diseases made its investigation. This, we charge, is most directly due to the non-existence of a correlating body between the hospital and the factory.

9. The powers and functions of the community health-governing body should be extended to the prompt investigation of all industrial complaints, and to the prompt remedying of them without the necessity of preliminary legislation against certain alleged responsible industries.

* For acute afflictions it is not necessary to go back beyond a few days or weeks, perhaps. For recurrent afflictions one should go back months or years. For chronic afflictions it is necessary to go back preferably five years or more. It is not to be expected that the busy entry clerk will fill out this record. It should be the duty of the history taker, oftentimes with the aid of an interpreter, and, if significant, even with outside assistance.

† Question "7" should be answered whenever there is any possible relationship between the patient's affliction and his industrial relations.

10. Too much importance is usually given to alcoholism, with a failure to appreciate that subjection to industrial health-hazards in itself induces and promotes stimulantism.

(3) As most of the problems concerned have to do with education and the creation through appeal and psychological means of a receptive and subsequently active state of mind of the masses concerned, it does not appear that much legislation is needed. In fact, in this field, legislation is probably more valuable for education than for what it actually accomplishes. On this account it should be very carefully prepared, of a conservative nature, and flexible in character so as to meet the many problems, often new ones, which arise. In short, enough legislation is needed to permit health-governing bodies to make investigations of specific complaints, determine the merits of the complaints, the kind and degree of health-hazards present, and the responsibility which both employers and employees should assume in eradicating any hazards found. In Ohio, the State Board of Health is in a position to handle the vast majority of these situations through *board of health regulations*.

This completes the series of articles entitled "A SURVEY OF INDUSTRIAL HEALTH HAZARDS AND OCCUPATIONAL DISEASES IN OHIO."

This series has intended to give the scope, principles and general summary of the investigation. The detailed description of processes themselves are described separately. (See following article.)

THE HYGIENE OF SPECIAL PROCESSES.

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(Continued from the November issue.)

RUBBER.—SPECIALTY MAKING.

(INCLUDING MECHANICAL GOODS, DRUG SUNDRIES, ACCESSORIES, ETC.)

As "almost anything can be made out of rubber," a vast number of employes are engaged in more or less factory types of processes included under the general heading above. As a rule, their health risks were of a general type plus the breathing of benzine fumes and soapstone dust. The articles made concern all manner of soft and hard rubber, and rubber fabric materials, from tiny rubber bands and washers, finishing-up processes on gloves, toy balloons, etc., the assembling of boots and shoes, rain coats, etc., to the fabricating of fire hose and enormous belts for power transmission purposes. In the small work many females were employed, while in the rougher and larger work, males were engaged.

This class of processes was investigated in 22 establishments in which 2,912 males and 1,668 females were so engaged. A good attitude seemed to exist between employers and employees in 15 of these places. While a large number of more or less ignorant foreigners were employed, still the usual type of fairly intelligent people, particularly females, was the rule. In some processes workers did not appear to remain long because of various objectionable features. Where health appliances were plainly needed, but 2 places were adequately equipped, 6 others fairly so, while 14 had given practically no

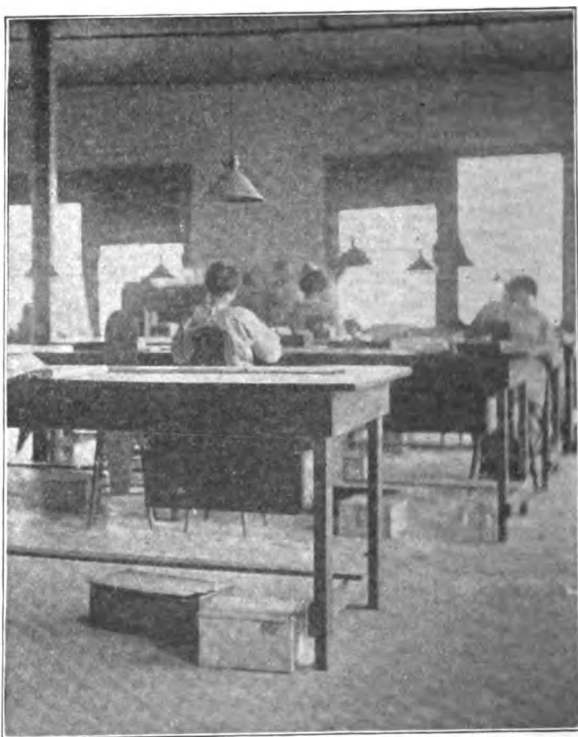


FIG. 57. MAKING RUBBER SPECIALTIES.

This room is well lighted, has an air-conditioner which changes the air continually, thus removing benzine fumes. (Some of the girls are not faced well as respects light).

attention to such features. The work day varied considerably: in 20 places it was from 9 to 10 hours, and in 2 between 10 and 12 hours; the noon recess was $\frac{1}{2}$ hour in 15 places, $\frac{3}{4}$ hour in 1 place, and 1 hour in 4 places. Practically all of the workers were unskilled labor. A considerable number of youths between 16 and 20 were employed, probably more than the number of workers who exceeded 40 years of age.

Considering these processes grouped by plants, our summaries show the following:

Dust was a negligible hazard in 4 plants, a fair hazard in 12 and a bad hazard (at least for some processes) in the remaining 6. Invariably this was due to soapstone; occasionally, to rubber ingredients. Quarters were kept *cleanly* in 10 places, fairly so in 8 more and not so in the remaining 4. *Dampness* was no factor in 18 places, but constituted a fair hazard in 3 others and was especially bad in 1. It was due to the escape of water and steam. In 17 plants *light* was good, in 3 only fair and in 2 bad. The *air* condition of the work rooms was satisfactory in 1 place, fairly so in 15 others, and bad in the remaining 6. The reasons for this were poor location, closeness and stuffiness, lack of room ventilating systems, and of local exhausts in many places where they should have been provided. *Heat* was no factor in 17 places, but was a fair to bad hazard in some processes in the balance. *Cold*, due to the opening of windows for ventilation, inadequate heating facilities, sedentary work in drafty places, and going in and out of hot quarters was a factor in some places. *Fatigue* was a considerable factor in 6 places, and more or less so in a number of others, due, principally, to the unlimited hurry of piece-work, constant standing, use of stools without backs, faulty postures, jarring processes and, occasionally, loud noises. The liability to the contraction of *communicable diseases* was a bad risk in parts of 5 places, fairly so in 10 others, but well controlled in the remaining 7. The factors were: the crowding together of employes, sometimes in large numbers in rather limited spaces, often quite filled with work benches, shelvings, machinery and stock; the use of common towels and drinking cups; improper wash-places and closets; spitting upon the floors; absence of cuspidors; frequent trivial injuries without first aid provisions; and the absence of gloves. Occasionally, goggles were needed, and, more especially, medical supervision to keep out persons having communicable diseases. The more or less common handling of articles, and the working together of both sexes were factors, although in no place was anything suggestive of an immoral atmosphere observed. The chief *poison* to which vast numbers of these employes were exposed was benzine. Occasionally, also, benzol, sulphur chloride, carbon bisulphide, ammonia, anilin dyes, wood alcohol, and other less commonly used substances. In but one plant were all employes satisfactorily protected from all forms of poisoning. In 7 others risks were not bad, while in the 14 remaining, acute poisoning, especially from benzine, was very possible. Practically all contributable factors discussed under poisons in Part III. upon principles of industrial hygiene were encountered, sometimes one and sometimes another, and sometimes many in the same establishment. *Industrial alcoholism* was favored in 19 places, 2 especially so, due to inadequate drinking water facilities, added to which the depressing effects of the hazards above cited should be taken into account.

In this vast number of people, it was natural that some *unhealthy* looking persons should be encountered, particularly where large numbers were employed. In 6 plants, however, all appeared well, but in the remaining 16, one or in some cases, many were seen who were unquestionably in the need of a physical examination to determine their health status, and, indeed, their safety towards fellow employes. A summary of the *complaints* encountered by talking to work people constitutes the following: dust and fumes causing nausea, dizziness, fainting, headaches, loss of appetite, loss of weight, tiredness, "benzine jags," eczema, coughs and colds, and "can't work long at this until I am sick and have to lay off for a few days." In some places workers

were hard to retain if other work was obtainable. Females were naturally worse affected. Ten cases of chronic benzine (and perhaps benzol) poisoning were seen in 4 plants. *Comments.*—Where so many health-hazards are involved, it is well to aim at a principal one if such a one exists, and endeavor to control it. Usually such a principle results in reducing other bad features. In this class of processes the chief aim should be directed first at a better control of benzine fumes. While these are not a deadly poison and produce no more than a temporary “drunk,” and, perhaps, unconsciousness, they are, when inhaled or absorbed, destructive to the blood corpuscles and fat-absorbent in their effects upon the system. Again, it must be said that toleration to such a hazard is beyond the limits of physiology. Inef-

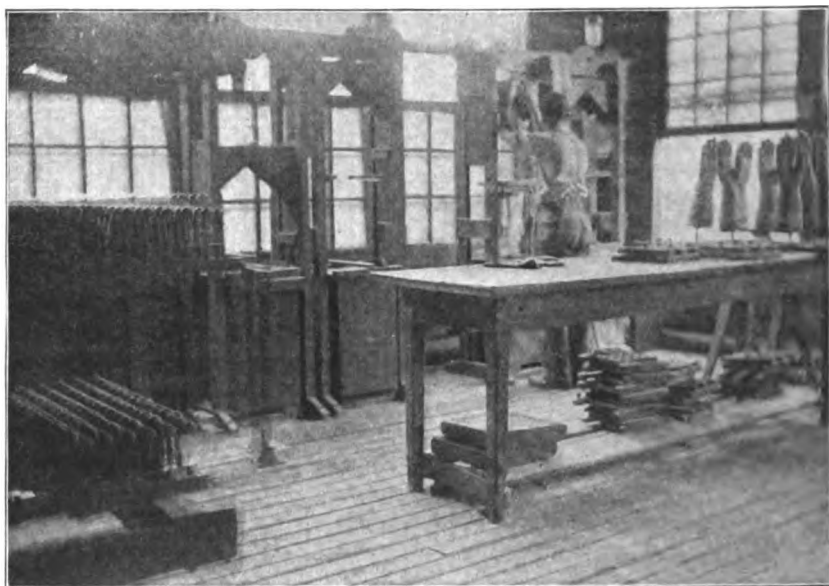


FIG. 58. RUBBER “COLD CURE” PROCESS.

This room has slatted floor with exhaust beneath to draw off heavy poisonous fumes (carbon bisulphide, sulphur chloride, etc.)

ficient hoods and exhaust systems, absence of such systems, failure to keep the atmosphere in motion and prevent dead air saturated with fumes, failure to provide gloves where needed, escape of fumes to neighboring departments or processes, and the practically universal use of benzine and benzine cements in open cups placed before the workers were the chief features. A feasible closed container for benzine has been mentioned under “Tire Building.” After benzine, the next chief hazard was soapstone dust. While much of this in the air was due to carelessness on the part of the employees, the processes are bound to produce it. Much of it can be curtailed by local exhausts, slatted table tops and floors, wet methods, improved methods, substitutes, and the wearing of light respirators. Particularly, should workers in the dusty proc-

esses be limited to those who give no personal or family history of tuberculosis. While the dust itself is non-poisonous and free from harshness, it excites coughing, which is all that is required to awaken tuberculosis in many persons with whom it would otherwise remain latent.

RUBBER.—COLD VULCANIZING.

This process is also called "cold cure" and "acid cure." It consists in dipping the articles to be vulcanized into various solutions carrying sulphur, or of applying the solutions to the rubber with a brush or sponge. Usually only a high grade of thin rubber articles unmixed with fabric are vulcanized in this way, such as gloves, cots, bags, etc., which are dipped into the solutions. We have also included here "splicing" of inner tubes for tires, in which the solution is applied with a brush in the presence of a brief air suction blast, the worker standing before a small stand.

The process was investigated in 15 establishments, engaging 200 males and 3 females at this work. A welfare attitude seemed to prevail between employer and employe in 9 places and fairly so in the other 6. The workers were of an intelligent type in 10 places, and a fair type of foreigners in the remaining 5 (usually the larger places). It appeared difficult to retain workers at the process, especially in 5 places and fairly so in 9 others. Health appliances, consisting of exhaust systems locally applied, of confinement of the process within cupboards and good room ventilation were adequate in but 1 place, altho in 14 of the 15 places some attempts were made to control the escape or concentration of the vapors. In all places workers were given gloves to protect their hands. Instruction concerning the poisonous solutions was good in 3 places only. The work day was between 9 and 10 hours in all places, with a noon recess of 1 hour in 3 places, $\frac{3}{4}$ hour in 1 place, and $\frac{1}{2}$ hour in 9 others. In 5 places some overtime was the rule. The work required very little skill. There was a tendency to employ youthful persons. It was found to be a type of process in which persons were first introduced to the rubber business. Only 2 persons were seen over 40 years of age. Construction of the work quarters was hygienic in 8 places, fairly so in 4 others and bad in the remaining 3. In 8 places the work-room was only partially partitioned off from other processes, so that vapors and odors were interchangeable.

In 10 places soapstone and sulphur *dusts* were a fair hazard, due both to carelessness in their use and the absence of a removal system. In the remaining 5, dust was negligible. Quarters were *clean* in 7 places, fairly so in 7 others and not so in 1. *Dampness* was no factor. *Light* was good in 12 places and fair in 3. The room air was good in 1 place, fair in 8 and bad in 6, due to the escape of fumes and the absence of means for promoting ventilation. *Heat* was no factor, but *cold*, due to inefficient heating and to the wide-opening of windows in order to dilute the vapors and fumes was a bad factor in several places. *Fatigue* was a fair factor, due to the hurry of piecework, constant standing, faulty postures, and the youthfulness of many of the workers. The contraction of *communicable diseases* was a bad risk in 3 places, fairly so in 10 more and negligible in the remaining 2. The hazards were common drinking cups, improper wash-places and closets, promiscuous spitting, absence of cuspidors, and lack of medical supervision. *Poisons* are the chief hazards in this industry. They vary in type and number, but include benzine, benzol,

wood alcohol, carbon tetrachloride, sulphur chloride, and carbon bisulphide. The risk of poisoning was bad in 8 places, fair in 6, while in but 1 were we satisfied the workers were amply protected. In some places the work was done on table tops with brushes, the solutions being kept in open-top jars. In many places the drippings accumulated on the work stand and floors whence evaporation took place. Eating in the same quarters was the rule. A very few workers had been at the process more than a few weeks or months. Industrial *alcoholism* was favored in 3 places, partly so in 9 others, and was negligible in the remaining 3, the factors being inadequate drinking facilities, and the depressing influences of poisons inhaled, ingested and skin-absorbed.

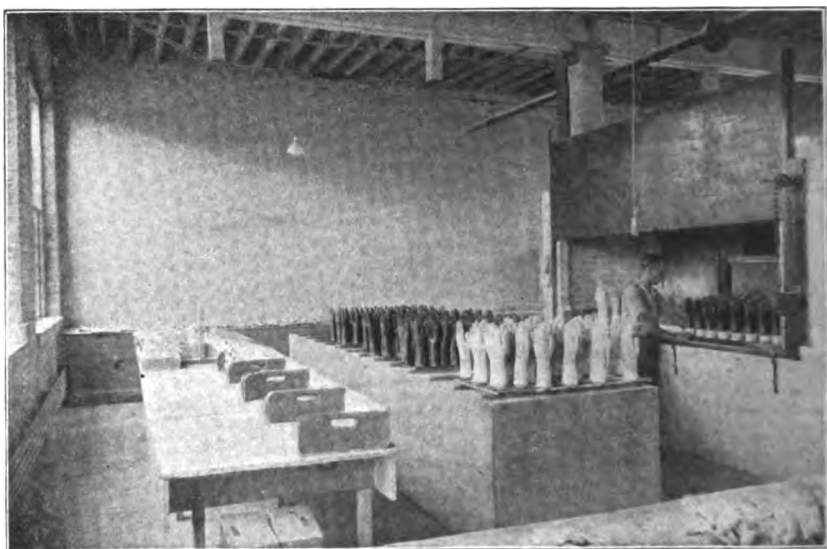


FIG. 59. RUBBER WORKS.

A carbon bisulphide dipping cupboard to the right, showing mechanical means of operating and dipping (carried on within cupboard) and the door to cupboard. Also slatted drying bench in center of room. Both this and the dipping cupboard are connected with a powerful exhaust system beneath the floor.

In all places some workers were observed who were *unhealthy* looking, while in 5, decidedly pale and anemic persons were seen. The chief *complaints* of the workers were the breathing of the fumes and vapors and dust. In 9 plants the following cases of occupational poisoning were diagnosed: carbon bisulphide poisoning, 4 positive, 2 tentative and a number of suspicious ones; sulphur chloride and tetrachloride poisoning, 4 positive; benzol, 1 positive. In addition dermatitis, dyspepsia, and neurasthenia were frequent observations. *Comments.*—Out side of the use of mechanisms to confine fumes and to remove them, the workers should be examined weekly and rapidly promoted or rotated to other work. Females and youths under 21 should not be so employed.

The liability among workers in carbon bisulphide to great physical and mental deterioration, including paralysis and insanity, the latter of both suicidal and homicidal characteristics, should be kept in mind.

RUBBER.—VAPOR CURE.

This process consists in exposing rubber articles, such as gloves, finger cots and drug sundries, to the vapors of sulphur chloride arising from a little of the substance placed upon a tin in a warming cupboard; also, largely used in some places in the splicing of the ends of inner tubes for tires, in which case carbon tetrachloride, and perhaps carbon bisulphide were additional substances used. (As this method of splicing tubes is done at room temperature, it has been considered under "Cold Vulcanizing.") The goods, except inner tubes, are exposed within the cupboards for the proper length of time and then removed, usually by hand. In most cases the workmen entered the cupboards for this purpose.

The process was investigated in 8 establishments in which 43 males were found to be so engaged. Foreigners constituted the main type of workers in 3 plants (all large places), while the balance were usually American-born. The men appeared to stay at the work well in 2 places, but only fairly so in the remaining 6. Health appliances consisted in confining the fumes within warming cupboards, having a hood and exhaust-pipe placed over the entrance thereto. In addition, the cupboards were, in some places, located within separate rooms, and had local exhaust systems provided to draw off vapors when the process was finished. The work day was 10 hours in all places, with $\frac{1}{2}$ hour for noon recess in 6 places, and 1 hour in the 2 remaining. The workers were only engaged at intervals in the process. The work required no skill on the part of the employees. All workers were between 20 and 40 years of age. Rooms containing cupboards were hygienically constructed in 7 of the 8 places. In 5 places the rooms were not well partitioned off, or were in the same quarters with other processes, such as dipping, specialty making and finishing.

Dust in the shape of soapstone and sulphur was a considerable hazard in 2 places, and fairly so in 3 more, the remaining 3 being satisfactory. *Cleanliness* of quarters was good in 1 place, fair in 5 and poor in 2. *Light* was not good in 2 places. The process required some heat, but in only 3 places could this be considered in a fair way detrimental. *Fatigue* was no factor. The contraction of *communicable diseases* was a bad risk in 4 places, fairly so in 2 others, and negligible in the remaining 2. The hazards were the use of common towels and cups, inadequate wash-places and closets, promiscuous spitting on the dusty floors, absence of cuspidors and lack of medical supervision. The *poisons* used by these workers were benzine, benzol, sulphur chloride, and carbon bisulphide. Sulphur chloride, however, was the only one usually concerned. Sulphur chloride itself is practically non-poisonous as used, since moisture is usually kept away from it. Otherwise the effects of chlorine and sulphur dioxide fumes would be noticeable. Industrial *alcoholism* was favored in 2 places, due, principally, to inadequate drinking water facilities.

In 3 places no unhealthy *appearing* workers were seen, while in the remaining 5, 1 or more were so. In 1 place workers *complained* of the effects of the fumes which caused coughing, sore throats and red eyes. *Comments*.—

Arrangements should be made to withdraw the fumes before opening the cupboards and entering them; or, to counteract their effects, ammonia gas has been recommended.

RUBBER.—PRESS-ROOMS.

In these rooms, steam vulcanizing is done by means of steel presses, having hollow chambers through which the steam passes. The molds containing the rubber objects to be vulcanized (as water bags and drug sundries), are placed within the vulcanizers for the proper length of time. Such a vulcanizer occupies about 4 to 8 square feet of floor space, and stands about as high as the head. They are usually arranged in rows.

The process was investigated in 13 establishments, and engaged a total of 468 males and 64 females. The attitude of employer toward workers appeared excellent in 8 places, and fairly good in the balance. The workers were intelligent persons in 7 plants and a fair type of foreigners in the balance. In spite of endeavors on the part of the employers, retention of the workers at the process was only fair in 9 of the 13 places. Health appliances, consisting of asbestos coverings to limit the heat given off by the presses, cool air blasts and ventilating schemes were good in 3 places, fair in 3 others, and absent or inadequate in the balance. The work day varied from 9 to 10 hours in all places, with a noon recess of 1 hour in 4 places and $\frac{1}{2}$ hour in 8. Over-time was sometimes resorted to in 4 places. The work requires comparatively little skill, except that practice engenders speed. The workers were pre-eminently between 20 and 40 years of age, with some under 20. The general construction of the workrooms was hygienic in 6, fairly so in 2, and bad in the remaining 5 places. Other processes were carried on in the same quarters in 5 places, and consisted of specialty work, trimming, cement mixing, packing, etc.

Soapstone dust, while present in all places, was a bad hazard in no more than 2. Much of this was due to the personal carelessness of the workers. Waste accumulations were bad in 2 places, and fairly so in 5, with the remaining, good. Dampness and humidity, due to escaping steam and water, was bad in 1 place, fairly so in 6 more, but was well controlled in the remaining 6. Light was good in 9 places, fair in 2, and bad in 2. The ventilation of the rooms was good in 3 places, only fair in 8 others, and poor in the remaining 2. Heat was a bad factor in 5 places, and more or less so in the remaining 8. Cold drafts from open windows, sedentary work, and heat or cold alternation was another common hazard. Fatigue was a fair hazard as the work was conducted in 9 places, due to piece-work, monotony, hurry, and the frequent lifting of heavy steel molds. The contraction of communicable diseases was a bad risk in 3 places, a fair risk in 8 others, and well controlled in the remaining 2. The risks were the use of common cups, improper wash-places and closets, promiscuous spitting, absence of cuspidors, lack of first aid provisions and medical supervision. Poisoning may be due in this process to benzine, benzol and, occasionally, antimony fumes from the rubber. In 9 places it was minimal, in 1 a fair risk, and in 3 a very bad risk. Open cups of benzine and of benzine and benzol cement were chief factors. Industrial alcoholism and coffeeism were decidedly favored in 5 places, and fairly so in 6 others, due to inadequate drinking water facilities, and the depression due to humidity, heat, fatigue and the fumes mentioned.

In but 2 places were all workers healthy appearing. In the remaining 11, one or more persons were at least in need of a physical examination to establish

their health status. Pallor, anemia and exhaustion were the physical signs. The workers *complained*, principally, of the excessive heat in 5 places, which was increased in warm weather. Also the smell of burnt rubber and the benzine fumes. In 1 room the temperature was 120°. *Comments.*—The generous use of asbestos coverings to presses seems to be very efficient in preventing heat loss in the process as well as promoting a healthier atmosphere. Room ventilation schemes, local air blasts and aid-agitators are necessary appliances in most of the places. While some places were kept comparatively dry, and escaping steam was limited, others were at the opposite extreme. Plenty of room space should also be given.

RUBBER.—CEMENT MANUFACTURING.

This process, called "cement mixing", consists in the admixture of powdered rubber with benzine, benzol and carbon bisulphide. Sometimes one and sometimes all constitute the solvent for the rubber, with some other ingredients. The process, because of the risk of fire and explosions, is usually conducted at a distance from the other buildings in a small brick and stone outbuilding. In some places, however, no such precautions were observed. The mixing may be done by hand in open containers, using a wooden paddle, or by machinery. After the mixing, the cement is drawn off and usually filled by hand into compressible tubes and cans to be sold, except that to be used at the plant itself, which is placed in five-gallon open or closed cans, and distributed to the various departments.

The process was investigated in 9 places, where it engaged 50 wage-earners, all males. Mechanical methods of good protective character were present in 5 places, while, in the other 4, antiquated methods were in vogue. The attitude of employers toward workers seemed good in all places. The workers were very largely foreigners and appeared to remain but a short time in most of the places. Health appliances, consisting of mixing machines, which confined the fumes by local down draft exhaust systems at the places of drawing off the cement, and of room exhaust fans, were adequate in 2 places, fairly so in 4 others, and absent in the balance. The foreman seemed well informed on the danger of poisoning in only 3 of the 9 places. Usually the danger was considered as a matter of course. The work day consisted of 9 to 10 hours in all places, with 1 hour for noon recess in 1 place, and $\frac{1}{2}$ hour in the other 8 places. No particular skill was required in the process. But 2 workers were observed over 40 years of age. On the other hand, a considerable number of boys were employed, this being their first introduction to the rubber business in some places. The construction of the workplace was hygienic in 7 places, fairly so in 1, and bad in the remaining. The process was carried on in an open, hand method in the same room with other processes in 2 places.

Dust was hardly a factor in the process. Quarters were *clean* in all but 1 place. *Dampness* was no factor except that in outdoor buildings adequate heating was absent. In only 2 places was the *air* safely freed of the fumes and vapors. The balance were badly in need of local exhaust ventilation schemes, particularly in the filling of tubes and cans, which was usually done by boys, working around a table. *Cold*, from the outdoor character of the work, was a bad feature in 1 place. *Fatigue* was no factor. The liability to contracting *communicable diseases* was a factor in most places, due to the

use of common drinking cups, improper wash-places and closets, promiscuous spitting and absence of cuspidors. The risk of *poisoning*, depending somewhat upon the carelessness of the operator himself, was present in all places. In 4, however, protection was by no means adequate. The chief poisons were benzine or naphtha, benzol and carbon bisulphide. Industrial *alcoholism* was well controlled in 3 places by providing adequate drinking facilities, and taking care of the fumes as well as giving personal instructions.

No *sick* workers were observed in 3 places; in another, all were new employes, while in the remaining 5, several persons, as a rule, were in need of a medical examination. The *complaints* of the workers were dizziness, nervousness, loss of appetite, easy fatigue, coughs, sore eyes and other symptoms of

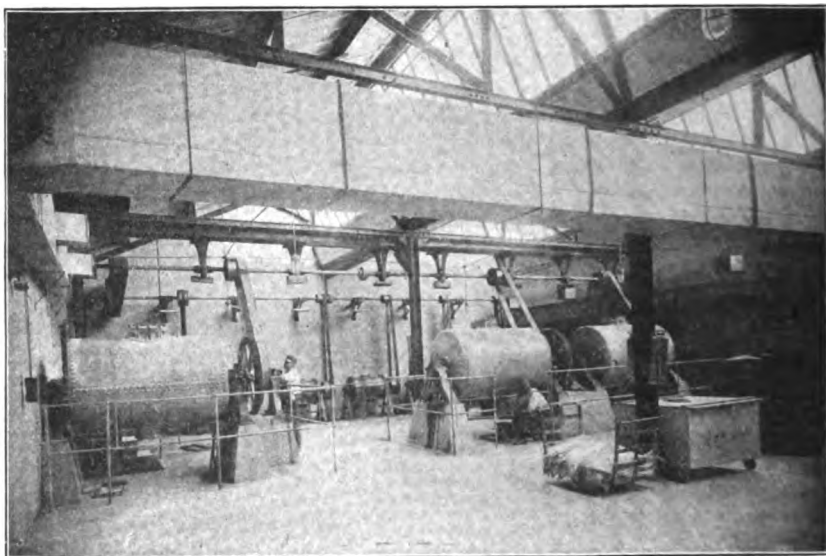


FIG. 60. MIXING RUBBER CEMENT.

Poisonous solutions and fumes are confined within rotary mixers. The room has exhaust floor vents along the edges, and fresh air is forced in continually from pipe openings along walls overhead.

the fumes named. Many workers refused to remain more than a day or 2. Some were seen who had been so employed for a number of years, but, of these, few were healthy appearing. *Comments.*—Every mechanical effort should be made to confine and remove fumes. In addition, workers should have a frequent medical examination, and they should be rapidly promoted, or frequently rotated to other positions. The liability to paralysis and insanity among workers exposed to carbon bisulphide has been mentioned under "Cold Vulcanizing."

RUBBER.—RECLAIMING.

By various chemical and mechanical processes old rubber is reclaimed from waste products about the rubber works and from vast quantities of old

rubber goods which are shipped in. It is a special industry by itself. The process consists in grinding, milling, chemical treatments and drying. The finished product is called "shoddy".

The process was investigated in 6 plants employing a total of 532 wage-earners, all males. The plants varied from 18 to 350 wage-earners. A vast majority of the workers were foreign-laborers who had a tendency to come and go. Adequate health appliances were found in 3 places, fairly so in 1 more, and not so in the remaining 2. The work day varied from 10 to 12 hours; the noon recess was $\frac{1}{2}$ hour in all places. Most of the workers were pretty steadily engaged at their various applications. Very few workers were under 20 or over 40 years of age. The plants were hygienically constructed in 2 places and not so in 3. A general jumbling of processes, usually to the detriment of health, was observed in 3 places.

Dust, consisting of lint, shoddy and rubber, was a bad factor in 1 place, fairly so in 2 others and no hazard in the remaining 3. *Cleanliness* was good in 3 places, fair in 1 and bad in 2. Protection from water, steam and *humidity*, which are essential features of the process, was good in 1 place, fair in 3 others, and bad in the remaining 2. Half of the places were poorly *lighted*,—large numbers of men worked in basement-like rooms barely lit with flaming gas jets. In 2 plants, however, light was excellent throughout. The general *aerial* condition of the work rooms was good in 3 plants, fair in another and poor in the remaining 2, due to the lack of control of vapors and fumes and the absence of ventilating arrangements. *Heat* was no particular factor in 3 places, but was bad in 2. Exposure to *cold* and drafts were frequently bad for men who went in and out of hot quarters. *Fatigue* was not much of a factor since the workers were usually well selected to laborious processes. The contraction of *communicable diseases* was a bad risk in 1 place, fairly so in 2 others and negligible in the remaining 3, due to inadequate washing places and closets, common drinking cups, promiscuous spitting, absence of cuspidors and lack of medical supervision. The *poisonous substances* used, mineral acids and alkalis, were well enough confined in 3 plants to constitute no hazard and fairly so in the remaining 3. *Industrial alcoholism* was rather favored in all plants, and especially in 2, through the lack of adequate drinking water facilities.

The appearance of the workers was good in 3 plants, while in the remaining 3 some workers were seen who were not *healthy appearing*. No health complaints were obtained from any of the employes, altho the inability of large numbers to speak English considerably hindered such inquiries. *Comments*.—The grinding up of old rubber should be hooded and exhausted to limit the dust, which, it must be remembered, is oftentimes rich in lead. Also more attention should be given to providing the workers with rubber boots and aprons who are employed at the watery and steamy processes. Those in hot, damp work should be given the privileges of shower baths, with change rooms and lockers in which to dry work clothes and keep their street clothes separate.

(Next month the subject of Pottery Manufacturing will be started.)

EDITORIAL SECTION.

How to Designate an Occupation.

There is great confusion everywhere in the use of terms which specify a worker's occupation. The same work performed in different places is often designated in different terms. This lack of standardization of terms for indicating occupational designations is a snag in the efficiency service of industries themselves as well as inspection services, insurance relations, census classifications, etc.

To obviate all this, the U. S. Census Bureau has compiled a manual of standard terms with its own symbol, and the whole arranged in both alphabetical and in classified manner. The name of the manual, which may be secured from the Superintendent of Public Documents, Washington, D. C., for 75 cents, is "Index to Occupations, Alphabetical and Classified". It has been prepared by Dr. Alba M. Edwards of the Bureau of Census and represents an immense amount of labor in going over the returns of the Thirteenth Census, grouping the same, and finally giving a symbol number to each occupation. The book contains 414 pages. There are over 9,000 occupational designations and 428 occupation groups. The whole scheme is sufficiently elastic, also, to provide for new occupations or others which are not specifically included.

The Index will be used by the Bureau of Census especially in classifying the occupation returned on death certificates, so that the occupation statistics in the vital statistics reports will be comparable with those in the census report on occupations. The Index will be of use to Federal and state bureaus, and to associations, societies, institutions, manufacturers, employers, treating agencies, and the like, and should be adopted at once by them all. By so doing we will all be speaking in the same terms when we mention the worker's occupation. This standardization offers a great step forward in our march of efficiency. Every person or party who has aught to do with workers or occupations should secure a copy of this manual.

Its terms and symbols will be used exclusively hereafter by the Division of Industrial Hygiene in making its investigations and reports.

* * *

The Milk Supply and Its Supervision.

Few problems are so difficult of solution as that presented by the adequate supervision and protection of the milk supply. No health

investment pays greater dividends than money spent freely, but wisely, for this purpose. The difficulties of collecting pure clean milk and preserving it in that condition until it reaches the consumer, are not sufficiently appreciated by the public. Milk is one of the best culture media, and it may conceal beneath its color, the symbol of purity, millions of disease-bearing bacteria and much stable refuse. Even when collected and distributed with the most painstaking care, milk may be a food unfit for human consumption. How much more must this be the case when milk is collected in the manner customary among non-inspected dairies. In the first place the dangerous qualities of milk come from the cow. Cows which are not tuberculin tested may be the subjects of tuberculosis long before the symptoms are apparent to the dairyman. Over six percent of the samples of milk taken on the open market in New York were found to contain bovine tubercle bacilli. The proportion varies in different parts of the world, but six percent probably represents the minimal number. Milk taken from cows too soon after parturition is not fit for human consumption. Milk taken from unwashed cows by milkers with unwashed hands is not a fit food for babies. During a recent investigation it was found to be the custom in only two of a total of thirty dairies, to wash the udders before milking. In no instance was it the custom to remove stable dirt and manure from the flanks and other parts. Almost as uncommon was the habit of washing the hands before milking. Is the filthy, manure-laden, dimly lighted, poorly ventilated cow stable the proper place to collect a food so susceptible of contamination, and a food destined for the use of infants and invalids? Facilities for removing the animal heat from milk are inadequate in the average dairy. The milk is taken in wide mouthed pails which have been cleaned and scalded but which are usually accessible to flies. The improperly or insufficiently cooled milk is placed in cans which have not been sterilized, shipped to the city without ice, and either distributed in bulk or placed in bottles which have not been sterilized and which may have come from homes where typhoid fever, scarlet fever or diphtheria prevailed. In Ohio more than ten thousand cases of typhoid fever occur annually. Milk is said to be responsible for from 25 per cent to 40 per cent of the cases. At least 2,500 cases of typhoid fever are due to milk in Ohio every year. In addition, diphtheria, scarlet fever, measles and tuberculosis may be and frequently are transmitted by milk. But the greatest harm done by milk is probably the harm done to infants, who perish annually in large numbers on account of filthy, bacteria laden milk. In every city where improved methods of collecting and distributing milk have

been insisted upon the resultant decrease in infant mortality has been distinct and substantial. How many of the more than 10,000 infants who perish annually in Ohio perish because of impure milk is a problem which can only be solved by preventing the sale of such milk and observing the results. Taken as a whole, there is no field of activity in which more rapid and more beneficial results can be secured by the health officer, than in the endeavor to secure pure clean milk for the people in his health district. Every health district should have some control over the sale of milk. No dealer should be allowed to sell milk without a license, and no license should be issued until investigation has shown that the cows are healthy, the dairy clean, and proper facilities are at hand for the adequate cleansing of cans, bottles and other utensils. In no other field of health work is cooperation more urgently needed. The township or village health officer will inform the city dairy department when typhoid fever occurs among the dairymen, and the city health department will send word to the township health department when a milk borne outbreak of disease occurs, affecting local dairymen. The grade of milk furnished by every dairyman should be published and the spirit of competition encouraged. Every city should have certified milk, inspected milk, and pasteurized milk, and the public should be informed of the comparative values of each kind. Lastly, in encouraging dairymen to produce clean milk the health department should attempt to create a demand for high quality by educating the public. Pure clean milk has a greater initial cost than carelessly collected milk. Clean pure milk is cheap at any price in the long run, and on the other hand, dirty impure milk is dear even if given away. Only persons with no eye for the future will attempt to discuss the initial costs of dirty and clean milks. To estimate their comparative values one must look far enough into the future to see strong, healthy individuals on the one hand, and disease, desolation and death on the other. In feeding milk to the baby you are sowing the seeds of disease and death or strength and health. The choice is easy. Insist upon clean pure milk.

* * *

Evils of the Small Health Unit.

In several issues of the Ohio Public Health Journal stress has been laid upon the evils of the small health unit. To the student of health conditions it must at once be apparent that citizens of cities are receiving greater health protection than citizens of townships. The evil would not be so great were the investment in both cases equal, but not infrequently the per capita expense for health protection is

greater in townships than in cities. In small units health officials are more frequently changed, and the experience which has made a health officer fairly efficient at the end of his term, must be gained all over again by the new appointee. Listlessness and indifference as a rule characterize the acts of the health officials of small units. The compensation is not such as to attract able men, and inefficient men expend the public funds recklessly and without securing proper returns. The time is coming when the rural citizen will demand and must receive the same measure of health protection as is given to his city brother. In order to bring about this ideal condition, rural health units must be made more nearly equal in size to city units. In other words, the state should be subdivided into large enough health districts to demand the services of whole-time, well-trained health officers, whose tenure of office will depend only upon good behavior and not upon the vagaries of politics. Health officers under the present conditions of affairs, especially those who possess breadth of vision, are the strongest advocates of this plan. All interested in the health protection of the state should urge the formation of larger health districts, so that in time the public demand will be insistent for this improvement. When that time comes the law-makers will accede to the wishes of the people, and better and more equal health protection will result.

* * *

The Field of Industrial Hygiene Investigations.

In the several years in which we have been compiling a reference library upon industrial hygiene and occupational diseases, primarily in order to answer the various inquiries which are made by manufacturers and others, we have been more and more impressed with the excessive duplication of work that has taken place already in this otherwise quite recent field of endeavor in America. We appreciate that this has been commented upon numbers of times by others, including the managers of industries who are being continually harassed by inspections of one type or another.

To our mind it is quite apparent that many investigations, even in America, are quite uncalled for since the information concerning the hygiene and diseases peculiar to various industries and trade-processes is already at hand, and oftentimes, multiply so, as in the reports of similar investigations elsewhere, text books, monographs, etc. In other words, there is very likely nothing new to be learned in any vicinity in the country in connection with the general hygiene survey of the printing industry, the machine shop, the foundry, etc.

In fact, the day of the general survey appears to have lapsed as far as its usefulness is concerned. New industries, of course, may require a looking into, but we need only to turn to some good library to obtain nearly all if not more information than would probably result from a field investigation, omitting, of course, specific regional peculiarities.

In fact, the true field of the industrial hygienist today would appear to be the investigation of specific instances of complaint, and in this case an intensive investigation. Such an investigation should always end in apprising the party or parties responsible for industrial mishaps. Where it is the employer, it will be found in almost every case that something will be done toward correction forthwith. If after a reasonable time such does not follow, then the provisions of the law should be thoroughly enforced. It is also necessary to impress upon the employer that the courts have held that it is his responsibility to see that his employes are properly instructed in matters pertaining to the conservation of health in the presence of industrial health hazards. Too often the responsibility for occupational diseases and diseases partly occupational lie quite entirely with the employe who will not follow instructions in personal hygiene.

But, to return to the theme, where intensive (and this usually means local) investigations have shown anything new, or where, after a library research it is found that but meagre information is extant concerning some feature which has been especially investigated, it is highly important that the results of the findings should be made public, as by publishing the same in some technical or scientific journal or report, and that an effort be made to inform all employers and employes in that particular branch of industry of the findings of such investigations. Here lies the field for the industrial hygienist of today, at least in most of the more densely populated portions of our country.

There is plenty of room, however, for investigations along the lines of physical examinations, personal hygiene inquiries, the study of absences, unemployment and changing personnel in various trades and industries.

* * *

The Greatest Single Offset to Health Hazards.

Since our civilized form of life imposes upon us as individuals many hazards to health which otherwise would not exist, it is worth inquiry to endeavor to establish what is the greatest single offset in general to such hazards; in other words, what is the greatest factor in

the maintenance of the general tone of health in the individual. We may look over the list: air, nourishment, cleanliness, happiness, work or application, rest, and sleep. There are some others but these are the most important.

To the average individual in the average civilized community of today, with its various opportunities and limitations, there is good reason to believe that a proper amount of sleep is the chief health conservator. A comparative few are harassed by any unphysiological amount of any of the other requisites than sleep. No doubt this is because of the habits and customs of the times.

All about us, life, both animate and inanimate, obeys the laws of Nature and passes into some form resembling sleep, usually while the sun is beneath the horizon. It would be impossible to advance such an argument as applying to the genus homo in our civilized communities, but it is not out of place to attempt to specify a minimum limit for sleep. Authorities on personal hygiene are pointing out more and more the necessity of securing at least eight consecutive hours of sleep and the advisability where this cannot be done as a routine, day-in-and-day-out matter to make up for the loss of any sleep sometime during the subsequent twenty-four hours. No doubt the advocacy of this policy would do more than any single factor, both directly and indirectly, in promoting health and preventing disease. There would appear to be but one class of important exceptions and this is the communicable disease menace, but even here the greater personal resistance must certainly be a vital factor.

As the new work, "How to Live", by Fisher and Fisk affirms, we should get use to making the single day our unit of routine rather than the week wherein we take an extra sleep Sunday mornings and otherwise pay a certain extra weekly attention to our personal hygiene.

* * *

Bedroom Ventilation.

There is one factor concerning bedroom ventilation in which well meaning advocates may be misguided. Primarily, ventilation means that there must be a movement to the air. The mere fact that there is a chance for movement does not gainsay that the air may be stagnant, or fairly so. While ordinarily open windows, especially if located on opposite sides of the room, provide for air circulation, there are many factors which may tend to offset this circulation. For example outside obstructions, buildings, walls, etc.

We would call attention, however, especially to screens of fine mesh as obstructives to the movements of air currents, particularly

in these parts where the winds of the daytime tend to subside at night. Probably a more serious obstructive agent is the presence of the decorative curtain which is also provided for privacy and may be composed of various "curtain goods" from silk and lace to scrim, lawn, dimity, muslin, bobinet, and similar materials. Any who doubt this have only to lift aside this curtain on an otherwise quiet night to note the immediate difference in the air circulation in the bedroom.

* * *

How Long Should the Noon Hour Be?

To the employed person as well as to the employer it is a matter of some importance how long a time should be devoted to the noon hour. Some workers are allowed none at all but are expected to eat their lunches in the occasional rest intervals which occur in the course of the work. Others are allowed 15 minutes, others 30 minutes, others an hour, etc.

There is no question but that all of these varying periods produce different physiological results, particularly when observed in the same type of industries and occupations. There is, furthermore, no question but that there should be a physiological basis for the duration of the lunch hour, the same to be governed by the character of the work pursued.

As a general rule, it may be stated that mental workers require the longer period, this because of the fact that they are usually not possessed of the same active tonicity in the circulatory regulations which bring about quick responses to changes of work which usually obtain in the physically active worker. That is, it requires a longer time to adapt the circulation to the digestion of food and its absorption in the case of the mental worker.

On the other hand, it is no uncommon thing to find that laborers and those engaged in active physical pursuits decry the long noon hour, claiming that they get stiff and really lose the desire for active work if they are required to wait around for half an hour or so after eating for the work whistle to blow again. Nearly always they prefer the extra half hour to be taken off at the end of the day. Physiologically, of course, maximum activity should not begin with the first few minutes of return to work, but be a gradual resumption.

* * *

The Need of a Publication Devoted to the Bibliography of Preventive Medicine.

The broad field included in the term "preventive medicine" is not in any way commensurately covered today by any periodical or index

which is published. The want of such a publication maintained in an impartial manner and broad in its inclusions and funds enough to enable a corps of expert workers to keep up with the enormously increasing literature, much of the best of which is now lost sight of because tucked away in more or less private or limited publicity centers, is an acute situation and very distressing to persons seeking information. It results in constant reduplication of work as well, which would not be undertaken in most instances were some efficient bibliography of periodic character at hand.

The old saying that there is nothing new under the sun would apply very much more often in the field of preventive medicine had we such an index available. While, of course, the bibliographies of medical journals and, indeed, of the Index Medicus supply a great deal, very many important writings, researches, and reports escape them.



PUBLIC HEALTH ACTIVITIES IN OHIO.

Ohio State Public Health Exhibit.

The Ohio State Public Health Exhibit has visited the following cities during the month of December: Youngstown, November 30 to December 3; Warren, December 7 to 10; and Conneaut, December 15 to 17.

Conferences with local health officials were held in Youngstown for Mahoning County and Warren for Trumbull County.

Owing to the holiday season the exhibit routine was abandoned but the exhibit was placed in a vacant store-room on the Public Square in Canton. The local board of health and health officer entered into the arrangements enthusiastically. The exhibit remained there from December 20 to January 3. A conference with local health officials was held in Canton for Stark County.

Public Health Organizations.

On November 30, the Delaware Health and Welfare League was organized with the following officers: president, Rev. E. A. Tittle; first vice-president, Prof. G. O. Higley; second vice-president, Mrs. Hettie McDowell; corresponding secretary, Miss Annie Kellogg; recording secretary, Mrs. A. L. Westgate.

On December 12, the Wapakoneta Visiting Nurse Association was organized with the following officers: president, Mrs. Bessie Seetlage; secretary, H. S. Vaubel, treasurer, F. E. Bailey.

Public Health Nurses.

County commissioners of Cuyahoga County have made an appropriation for the employment of three county public health nurses. The nurses appointed were Misses Pearl Kamerer; Edna Dwell, and Daisy Perrine. They were appointed December 1 by Dr. Robert H. Bishop, Jr., medical superintendent of the Warrensville Tuberculosis Sanatorium.

Miss Caroline Ehlert, who has been employed by the Trumbull County Anti-Tuberculosis League for the past two years, resigned her position as county public health nurse. Her resignation took

effect December 15. Application for her successor has been made to the State Supervising Nurse and will be filled on January 1.

Mrs. Florence Lee, public health nurse, employed by the Cambridge Public Health League, resigned on December 23. She will be succeeded by Miss Margaret S. Simpson on January 1.

Miss Viola Fell, public health nurse, employed by the health committee of the Zanesville Federation of Women's Clubs, resigned on December 15, and will be placed in Marietta January 1.

Applications for nurses are on file with the State Supervising Nurse from the following cities: Marietta, Cambridge, Warren and Wapakoneta.

Miss Alice J. Whittier was employed as superintendent of nursing work by the Delaware Health and Welfare League on December 1.

The board of education in the city of Lima employed Miss Ethel Montague as school nurse on November 8.

On November 22, Mrs. Elida Wyans resigned her position as public health nurse in Scioto County and was succeeded by Miss Margaret S. Purves on that date.

The Greenfield Public Health League employed Miss Norah D. Abbe as permanent public health nurse on November 30.

Tuberculosis Hospitals.

The State Department of Health has received from November 1 to November 30, inclusive, 234 notifications, 136 of which were admissions and 98 discharges, of patients in Ohio tuberculosis hospitals, exclusive of the municipal hospitals maintained by the cities of Cleveland and Cincinnati. Of these 234 notifications, 173 were referred to local public health nurses for investigation and report; 12 to local health officers for investigation and report; 6 to health officers in other states; 10 were investigated by a public health nurse from the State Department of Health, and 33 were pending investigation on December. There were 25 notifications pending investigation on November 1, and of these 9 were investigated by a public health nurse from the State Department of Health. There were on hand December 1, 49 notifications pending investigation.

The tabulation of notifications by hospital shows the following results:

<i>No. Patients Reported.</i>	<i>Institution.</i>	<i>Admis- sions.</i>	<i>Dis- charges.</i>	<i>Total.</i>
48	Ohio State Sanatorium.....	22	27	49
4	Butler County	3	2	5
34	Franklin County	20	17	37
33	Lucas County.....	23	18	41
8	Dayton District	4	5	9
8	Lima District	6	5	11
6	Springfield District	5	2	7
15	Springfield Lake District.....	15	9	24
18	Rocky Glen (McConnelsville).....	17	13	30*
21	St. Anthony's (Columbus).....	21	..	21
<hr/> 195		<hr/> 136	<hr/> 98	<hr/> 234

* Includes admission blanks dating back to February, 1915.

Prevention of Blindness.

During the month of November, the Division of Public Health Education, State Department of Health, received 67 case reports of inflammation of the eyes of the new born, distributed over 26 counties; 6 case reports of ophthalmia neonatorum from 6 counties and 27 cases of trachoma from 8 counties. The follow-up investigations of this total of 100 cases were conducted by mail with the exception of 10 reports of inflammation and 2 reports of ophthalmia, which necessitated primary investigations by telephone. In 3 instances it was necessary for the Division to supply nursing service direct, all other cases being referred either to local nurses or left entirely under the responsibility of attending physicians and health officers.

There are pending at the present date investigations of 4 instances where reports of cases of inflammation of the eyes of the new born are stated not to have been submitted to local health officers as required. The evidence in the hands of the Department concerning one case was forwarded under date of November 22 to the prosecuting attorney of Hamilton county. Reports of further investigations, by local health officers, are being awaited in the three other cases.

A public health nurse in the Division of Public Health Education, State Department of Health, visited 6 cases of ophthalmia in Cleveland and investigated cases in Fairplay and Unionport, Jefferson County, during the month of November.

Maternity Boarding Houses and Lying-in Hospitals.

Inspections were made during November in Cleveland, of the Florence Crittenton Home; Maternity Hospital; Mrs. Joanna Ortlieb; Mrs. Anna Wright; Salvation Army Home; The Retreat; St. Ann's Maternity Hospital and Asylum; and Mrs. Genevieve Kerr

Wing; in Peninsula, Mrs. Nellie Wing. These inspections were made jointly with representatives of the Board of State Charities.

There are 36 institutions holding the State Board of Health license at the present time.

Upholds Health Board in Fight.

Acting Police Judge Holloway upheld the health board in its efforts to legislate against dealers who maintain unsanitary conditions about their business places, when he fined P. J. Ater, a clerk in the Lamson fish market, East Market St., \$1 and costs for selling decayed fish.

"The Ater Case is only another example," said Dr. B. F. Force, of the health board. "This question has been threshed out before, and we have always won. If we could not legislate in these matters, there would be no need for a health board. We shall continue to demand that dealers in food products maintain sanitary conditions about their premises, and to keep their products up to a standard in cleanliness."—*Akron, O., Journal*.

Didn't Report Smallpox Case; Is Fined \$100.

For failure to report to the authorities a case of smallpox, Thomas Tulipano, 249 North Hine street, arrested on warrant sworn out by Edward Schroeder, chief of the sanitary police department, was fined \$100 and costs by Judge Welush.

Two of Tulipano's children are said to have been afflicted with smallpox and he failed to report the cases to the authorities.—*Youngstown Vindicator*.

Woman to Inspect Food.

Cleveland is soon to have a woman on its food inspection force.

Announcement was made at the city board of control meeting that a new force of food inspectors will be named to assist the food inspection division and the city bureau of laboratories. No salaries will be paid these inspectors by the city. According to Dr. C. E. Ford, commissioner of health, their services are to be retained through co-operation with Consumers' League. Clevelanders interested in city health work and the work of the league will give funds for the employment of four inspectors.

According to City Chemist Wilbur White at least one of the inspectors will be a woman. The new force will assist in sampling food and in bake shop and restaurant inspections.—*Cleveland Plain Dealer*

CURRENT COMMENT ON MATTERS OF PUBLIC HEALTH AND SANITATION.

Results of Pre-Natal Care in New York.

A study of 3,416 cases of labor reported by Mary Lee Edward in the Obstetric Clinic of the New York Infirmity for Women and Children shows a somewhat different result than that which appeared from Dr. Whitridge Williams' studies at Johns Hopkins. The percentage of still births was below that of Sloane Maternity or the Munich Frauen Klinik, while the total mortality was 1 percent lower than that at Hopkins. There were 215 deaths, of which the greatest number were premature births (44). The two greatest causes of total mortality were from labor (43%) and syphilis (6.5%). There were 13 per cent of undetermined causes in which syphilis probably played an important part. For the largest group of cases, that due to labor, the greatest number of casualties were caused at actual delivery and so pre-natal care had no influence in their prevention. The amount of syphilis discovered was small, 6.5 percent, compared to Williams' 26.4 percent. The writer believes the difference due to the fact that Williams' cases were, half of them, colored.

For the control of prematurity and inanitation due to home surroundings of parents, the hope of improvement is centered in the social service department of the clinic. Patients register at seven months, return at bi-weekly intervals and are dropped from the list if they do not report regularly.

Syphilis is of course the greatest single cause of deaths. Patients are subject to Wassermann if even suspicious. Uraemic conditions are controlled by routine urinalyses and dystocia is avoided as much as possible by careful pelvimetry.

The conclusions show that for a period of twenty years effort pre-natal care has very definite results in reducing infant mortality. — *Abst. Jour. A. M. A.*, 1915.

Physical Examination of Schoolchildren by Private Physicians.

The attention of all the physicians in the city has been called to that section of the sanitary code and to the regulations governing the physical examination of schoolchildren of the city of New York. It is the desire of the department of health to have all schoolchildren physically examined by their private physicians and to have the medical

inspectors assigned to duty in the schools examine only those children whose parents are unable to afford the services of a private physician. The department announces that it counts on the cooperation of the medical profession and that prompt examination with the immediate return of the card, properly filled out, will greatly facilitate the work of the Bureau of Child Hygiene. A copy of the card form together with the regulations of the board of health with respect to this examination is being sent to all physicians in the city.

Tuberculosis a Disease of Childhood.

Tuberculosis is most commonly taken by young children from tuberculous parents, relatives or friends, who kiss and caress them, or from floors, food, clothing or other articles which have been contaminated with tuberculous sputum. It is probable that four out of five children have been infected in this way, and that one out of ten has been infected from the meat or milk of tuberculous animals. The drift of opinion of medical investigators is towards the belief that tuberculosis is essentially a disease of childhood. That all who are infected with the disease in childhood do not suffer from it in later life is due to the fact that their general health has been maintained by nutritious food, fresh air, sufficient sleep, lack of worry and overwork and that they have not been subjected to the depressing effects of other infectious diseases, such as measles, whooping cough, typhoid fever, pneumonia, etc., whereby their resistance to the tubercle bacillus and its poison has been diminished.

Tuberculosis is curable if treated early. The tendency of the best physicians of today is to limit the treatment to open air by day and night, sunlight, cleanliness of person and surroundings, rest in bed when necessary and sufficient, wholesome food. Children, be they tubercular, anemic or well, thrive and make more rapid progress in their work in open air schools than in closed schoolrooms.—*Abst. Public Health (Michigan)*, 1915.

Nearly 100 Per Cent of Population Suffers from Physical Impairment.

NATIONAL TUBERCULOSIS ASSOCIATION PRESENTS FIGURES IN PLEA FOR NATION-WIDE MEDICAL EXAMINATION DAY, DECEMBER 8TH.

In a plea for every man and woman in the United States of adult age to join in a movement for annual or other periodic medical ex-

amination of themselves, which will be launched on December 8, The National Association for the Study and Prevention of Tuberculosis presents figures in a Bulletin issued today which show that practically 100 per cent of the supposedly well people of the United States over 30 years of age have some physical defect or impairment. About 70 per cent of these impairments were of a more or less serious nature. There were besides about 30 per cent of defects of a minor character.

The figures which the National Association presents are based upon the careful studies recently made by the Life Extension Institute among two highly specialized groups of people, the first group consisting of workers in the Ford Motor Company of Detroit, and the second group consisting of employes of commercial houses, banks and trust companies in New York. The records of these examinations show that practically none of those examined, men and women, are normal in the strict sense of the word. Another striking fact in the examination is that only 10 per cent of those who were impaired were aware that there was anything the matter with them. This fact alone, the National Tuberculosis Association points out is sufficient to make every man and woman in the United States give careful consideration to the necessity for at least one physical inventory of his entire body a year.

The largest group of more or less serious impairments discovered were those showing sugar, albumen or casts in the urine. More than 45 per cent of the above-mentioned groups showed defects of this nature. In the same groups about 23 per cent showed abnormal blood pressure, while nearly 27 per cent showed combined disturbances of circulation and kidneys. Organic heart disease, thickened arteries, lung trouble leading to possible tuberculosis, nervous affections, digestive troubles and venereal disease were among the other impairments discovered, practically all of which had escaped the notice of the individuals examined.

During Tuberculosis Week which will be celebrated throughout the United States from December 6 to December 12, a national medical examination day will be observed on December 8. Groups and individuals will be urged to make arrangements for physical examination on that day. A circular describing in detail how the advantages of medical examination day may be obtained and indicating certain physical impairments which everyone should look for will be sent on request from the office of The National Association for the Study and Prevention of Tuberculosis, 105 East 22nd Street, New York City.

Epidemic Cerebro-Spinal Fever: Its Recognition and Treatment.

According to the authors this disease is divided into three stages.

STAGE I. CATARRHAL.

An initial naso-pharyngitis was constant and predominant in one hundred seventy cases. This condition was also found in every definite carrier. Attention is attracted to the throat by the husky voice. The type of catarrh generally is a dry one. The nasal secretion is sometimes tinged with blood, and crusts, sometimes bloodstained, are present in the nose. Prostration is more marked than in ordinary cases of coryza. The pulse and temperature are not usually much affected at this stage. Streptococcus infection of the naso-pharyngeal mucosa is almost always present at this time. The diagnosis during this stage is important, and should be confirmed by bacteriological examination of the spinal fluid.

STAGE II. SEPTICAEMIC.

No sharp line of demarcation exists between Stage I and 2. Headache, pains in the back and limbs, chilliness, nausea, vomiting occasionally, mental depression, photophobia and pain in the orbit are symptoms associated with this stage. The temperature varies between 100° and 102° F., and the pulse is moderately accelerated. The patient is markedly hyperesthetic. Rigidity and retraction of the head may occur during this stage. The skin is usually flushed and the tache cérébrale is present.

STAGE III.

The meningococcus is infrequently found in the spinal fluid in Stages I and II, but in Stage III it is almost invariably present. Depression and stupor result, and strabismus, optic neuritis and deafness may be met with. There may be incontinence or retention of urine and feces, and priapism is often seen. The reflexes disappear and Kernig's and Macewen's signs can be elicited. Head retraction is increased and convulsive seizures are not uncommon. The pulse is slow, cyanosis is present and there may be Cheyne-Stokes breathing and low muttering delirium. Death may occur by respiratory failure or coma. Fulminating types appear occasionally. Rashes occur in about twenty per cent of the cases, especially in the severer types. In form they vary from erythematous to purpuric and usually they appear during the third stage or following the administration of serum. Relapses are not uncommon and may occur after apparent complete recovery. Chronic cases usually die in about three or four months.

If the disease is recognized in Stage I, and appropriate treatment given, recovery is invariable. Recovery is usual even when the disease is only recognized during the second stage, and the prognosis is by no means hopeless even when treatment is delayed, until the third stage. Potassium permanganate 1-1000, is useful as a throat spray in the first stage. Flexner's serum should be administered in the second and third stages without awaiting bacteriological confirmation of the diagnosis. Good nursing and proper hygienic surroundings are essentials of the treatment. — Abst. *British Med. Jour.* 1915.

Ubiquity of the Diphtheria Bacillus.

WIDESPREAD PREVALENCE OF THIS GERM AMONG UNSUSPECTING PERSONS,

AS SHOWN IN A RECENT PUBLICATION OF THE U. S. PUBLIC HEALTH SERVICE.

It has long been known that diphtheria germs are present in the throats of many perfectly healthy persons and that many cases of this disease may be accounted for only by their infection from such "carriers". To what extent these germs occur among healthy persons has been a point that has never been definitely determined, some workers claiming that as many as one in every twenty persons carried these germs and distributed them more or less indiscriminately. To determine this point the U. S. Public Health Service conducted an investigation of the prevalence of diphtheria carriers in the city of Detroit during the winter of 1913-14. This investigation stands as one of the most thorough and painstaking researches of its kind.

Should this report be read by all of the inhabitants of Detroit over 4,000 of them would recall the visit of the "Health Officer" who examined their noses and throats and took "cultures" from both locations.

In the laboratory the officers of the Service examined the 8,758 cultures taken from 4,093 persons; five bacteriologists examined the "smears" from an average of 158 cultures a day. The results of this examination were that very nearly one per cent — .928% to be exact — of all the persons examined was found to carry diphtheria germs in their throat or nose or both.

One per cent does not ordinarily sound large to the average person, but let us see what it means to the individual. In time of epidemic prevalence probably one in every hundred persons he meets has diphtheria germs in his throat and in all probability on his hands and

clothes as well, since it is one of the most common practices in the world to put the hand to the mouth. It is probable that the average individual comes in contact with a hundred or more persons every day and is hence practically daily exposed to infection with diphtheria. Some persons, mainly those remaining at home, associate with but few, but other members of the household are not so isolated. School children come in close contact often with more than a hundred others in a day. Occasionally one may even see a hundred persons on a single street car and none will doubt that many more than that number will cough into the air of a moving picture theatre during an evening.

To demonstrate further what one per cent means, let us see what are the actual figures. In 1914 the official census of Detroit was 537,650. One per cent of this is 5,376. It would be difficult indeed for any one living in Detroit to avoid contact with one, two, five or more of these 5,376 disseminators of diphtheria germs. Nor is there reason to believe that in time of epidemic the figures for any other large community are lower in proportion.

These data gathered by the Public Health Service, as well as data of the same nature obtained by other workers, demonstrate one of many reasons for personal care of the throat and nose, avoidance of too intimate contact with others, and the necessity of early preventive measures in the case of those suffering from "sore-throat" and lesions suspicious of diphtheria.

The Vaccine Treatment of Some Complications in Scarlet Fever.

The fact that the exciting cause of scarlet fever is not known renders the use of vaccines for anything but its complications a doubtful practice. In the complications, however, vaccine may be made of the organisms isolated. In hospital cases prolonged detention is usually due to some complications, such as small abscesses, otitis media and paronychia. In using vaccines cultures should first be made, and if a mixed culture is secured a mixed vaccine should be given at once to save the time necessary to isolate the various organisms present. The dose should be small at first, and gradually increase. The author has not found it necessary to depend upon the opsonic index, but have been guided rather by the physical condition of the patient. In one case treated by the author, a discharging ear was followed shortly by a rheumatic affection of the joints which settled at last in the left elbow. Incisions were made into several joints and pus evacuated from all. His condition became rapidly worse in spite of active

treatment until amputation of the arm appeared necessary. Before resorting to this final step, an autogenous mixed vaccine was prepared and administered. After the second dose uninterrupted recovery occurred. In another case complicated with rheumatism, multiple abscesses and otorrhea developed. Other treatment proving unavailing, an autogenous mixed vaccine was prepared and administered in increasing doses. Rapid improvement followed and recovery soon took place. The author has met with the same success in treating a large number of other patients with some of the complications of scarlet fever with vaccines. He advocated this form of treatment in all such cases as in his opinion, it leads to a prompt and permanent cure without being detrimental in any way to the patient's welfare. — *Abstr. Jour. of State Medicine*, 1915.

The Campaign Against Cancer In Missouri.

The most recent addition to the many agencies, national and local, now engaged in the warfare on cancer is the Department of Preventive Medicine of the University of Missouri. This Department has just published in the University Bulletin a special article on the early diagnosis and treatment of cancer by Dr. F. A. Martin, instructor in pathology. The purpose of this bulletin is to call the attention of its readers in Missouri and elsewhere to the campaign for the education of the laity which is being carried on by the American Society for the Control of Cancer, the American Medical Association and other national and state organizations, and to give a brief general survey of the cancer problem as a phase of preventive medicine.

The knowledge and skill of surgeons in the treatment of cancer has progressed, according to the Bulletin, almost to the limits of what is possible and if the percentage of cures by this, the only method of treatment which offers reliable hope of cure, is to be increased, the patients themselves must cooperate by seeking earlier diagnosis and treatment. On examining the histories of a large number of cases it has been found that the patients whom the surgeon failed to cure were those who came to him late in the disease when the cancer had spread to such an extent that to remove all the cancer cells would have required an operation so great that in itself it would be sufficient to cause the death of the patient. On the other hand it is found of another group of cases which sought treatment soon after the cancer was noticed that 100% were cured. To increase the percentage of cases treated early the University Bulletin urges that laymen learn the meaning of cancer and its first warnings in order that they may

go to the surgeon in time when the cancer is still in the early stages and the chance for cure is high.

Among the many facts already known about cancer, perhaps the most important is that the disease nearly always begins in some form of abnormal tissue. This abnormal tissue which is often easily recognized, may have existed for only a few months or it may have been present from early childhood without causing trouble, only to change into cancer in later life. To these bits of abnormal tissue or groups of cells, has been given the name of "precancerous lesion." The Bulletin says that not all such conditions develop into true cancers, but most of them should be kept under careful observation by a competent medical advisor and removed as soon as there is real danger of malignant disease. This is the only known method of preventing, as distinguished from curing, cancer and the Missouri Bulletin describes carefully the various forms of precancerous lesions which should be regarded with suspicion. Among these are pigmented moles, cracks on the lip, blisters, scabs and similar persisting abnormal conditions of the skin. Probably only a very small proportion of these conditions become cancer but when moles, for instance, are so located that they are subject to constant irritation and when in later life they change in color and appearance and begin to grow it is time to have them promptly attended to. Moles and warts should never be treated with caustic but the whole lesion together with its so-called roots should be removed. When a burn on the tongue or lip from smoking does not heal within a few months it is a source of danger. Generally speaking, the removal of precancerous lesions is a trivial operation requiring only local anesthesia.

After true cancer has developed it is still possible to cure a large percentage of cases if the surgeon is given a fair chance while the disease is still local. All cases of cancer are local in the beginning and may remain so for a few weeks to several months. It is during this period that surgical treatment offers the possibility of practically 100% of cures. Unfortunately for the patient pain is so rare at this stage of the disease and the conditions seem so trivial that in a great number of cases the opportunity to be saved is forfeited by the delay. In cancer of the breast, for instance, the cases cured by the late operation amount to about 30%, but by an early operation, at least 80% are saved. If every woman who is not nursing would go to a surgeon within 24 hours after she finds a lump in her breast, 90% of the cases of cancer of the breast would be permanently cured.

Cancer of the tongue is perhaps the most malignant and cures by the late operation are few in number. If a small ulcer appears on the

tongue consult a surgeon at once. When such an ulcer is produced by a ragged tooth, consult a dentist first and then if the ulcer does not heal within a short time after the cause has been removed it is a surgeon's task.

In almost all the common forms cancer is connected with some kind of irritation. Gall stones, for instance, should be removed since it is established that from four to fourteen percent of all cases are followed by cancer.

Cancer of the uterus gives early warning by a discharge of an unusual character at an unusual period and of unusual duration. The removal of the uterus is not a dangerous operation and if the disease is recognized at an early stage the life of the patient can be saved.

The Bulletin issues an emphatic warning against quacks and their bogus testimonials, pointing out that their method of deception lies mainly in the diagnosis. There are so many conditions closely resembling cancer that the average layman cannot distinguish among them, and it is behind such conditions which are not cancer and which would tend to heal without treatment that the "cancer specialists" take their stand and make their false claims.

The Department of Preventive Medicine will supply copies of this cancer bulletin, Medical Series No. 9, upon request to the University of Missouri, Columbus, Mo., as long as the supply lasts.

Thymol.

WHERE DOES THE HOOKWORM REMEDY GO?

During recent years large amounts of thymol have been used in the treatment of hookworms. Scientists have been greatly interested in determining the manner in which this drug is excreted from the human body. In Hygienic Laboratory Bulletin No. 101 of the U. S. Public Health Service, the results of an investigation of this important and interesting problem are outlined, and while considerable has been added to the scientific knowledge of the subject, the conclusion is reached that as yet no satisfactory explanation for the apparent disappearance of administered phenols has been found.

Swimming Pool Sanitation.

REFILTRATION AND CHEMICAL DISINFECTION NECESSARY SAYS PUBLIC HEALTH SERVICE.

Ninety-one large municipalities in the United States have established public swimming pools to meet the demand for knowledge of

swimming. Swimming pools are on the increase. The United States Public Health Service publishes an article by Wallace A. Manheimer, Ph. D., of Columbia University, on the results obtained from a careful examination of six swimming pools.

POLLUTED SWIMMING POOLS MAY TRANSMIT DISEASE.

It is pointed out in the report that in swimming in polluted water, typhoid fever, conjunctivitis, and other diseases may be acquired. The report gives in detail the results of the bacterial analyses made of the various pools and of the effects of refiltration and chemical disinfection. It is pointed out that when the water is unfiltered it is apt to be cloudy, thereby making the danger of accidental drowning very great. When refiltration is practiced the water becomes clear and this danger is obviated. The report concludes that the cubic capacity of a pool affects its sanitary condition; that the process of adding dilution water is an efficient means of reducing the number of bacteria in the water, and that the supervision of the plant and the class of attendants are also important factors in pool sanitation. The combination of refiltration and disinfection by the use of calcium hypo-chlorite renders the sanitary condition of the water excellent. Many of the colleges and secondary schools of the United States have as a graduation requirement, a proven ability to swim. This important field of athletics should be surrounded by every sanitary safeguard.

Autos May Help Spread Typhoid.

The automobile may be a factor in the transmission of typhoid fever, according to the California State Board of Health, because of the increased use of the automobile by camping parties. During a single month of the past summer, 2,610 motor cars passed a given point along a popular mountain road, most of the occupants of which did not stop at summer resorts, but camped at favorite spots beside the highway.

Since a camp-site near a running stream is nearly always selected, the question of whether or not these campers de luxe observe ordinary rules of sanitation, is of considerable importance. Unless care in preventing the pollution of streams is observed, and unless all refuse is either burned or buried, such a camping spot may become a source of disease dissemination.

Every physician in a large city knows that cases of typhoid fever in persons who have but recently returned from summer vacations,

appear regularly every year and it is always a difficult matter to trace the source of infection in these cases, particularly if the patient's travels have been at all extensive.

The State Board of Health warns automobile campers, as well as all campers, to exercise care in sanitation, always to leave camps as one would desire to find them, never to drink water, without boiling, from a running stream, unless sure that it is not contaminated, and to co-operate in every possible way in keeping clean the wonderful playgrounds of California. — *California State Board of Health*, 1915.

Veterinary Medicine and Public Health.

Preventive medicine is no longer an isolated part of the medical science, but is closely related to psychology, sanitary science, sociology, veterinary science, climatology, entomology, and all other branches related to public health.

The studies of animals and the experiments which they have made possible have contributed much to the development of modern preventive medicine.

The report of the New York State Veterinary College for 1913 and 1914 shows in a brief way the great amount of work that is accomplished by the veterinary department and its relation to human diseases. Since our food supply depends largely on the supply of domestic animals, it is essential that these animals be abundantly produced and kept in proper condition. Shortage in supply means increase in the cost of living which in turn means poorer living and deteriorations in health. The control of preventable infectious diseases in cattle not only maintains the source of food supply but also prevents human infection from the consumption of infected animal material. The control of animal diseases such as pleuro-pneumonia, tuberculosis, glanders, foot and mouth disease, rabies, plague and others, is of great importance to the man and to public health.

There is close association of veterinary medicine and preventive medicine and to separate these two departments, is very detrimental to the needs of public health. The report of the New York State Veterinary College shows this association and emphasizes the importance of the development of both branches of the medical science in their relation to public health. — *Abst. Med. Review of Reviews*, 1915.

Medical Discoveries Not Accidental.

CORRELATED INVESTIGATIONS CONQUER DISEASE.

The victories which medical science has won over disease have in very few instances, if ever, been decided by a lucky chance. Only by utilizing the accumulated knowledge of centuries and all the information available from his contemporaries, has the investigator been enabled to make significant discoveries leading to the cure or prevention of disease.

Contributions to the medical science of today come from the most diverse sources. The physical chemist determines one fact, the pathologist another, the economist and a host of other specialists, make and record their observations and the interpretations which they place upon them. These discoveries must stand trial at the hands of contemporary workers along the same lines. If they stand the test, they become incorporated into a working hypothesis to be applied practically until new discoveries show it to be false in fact or interpretation, or place it in a new light where its application may be different.

Thus in the case of the disease which we know as malaria (meaning "bad air") the original observations that the disease prevailed in swampy regions, and tended to die out when the region was cultivated and improved, have stood the test of time and still stand as facts. The interpretation, however, that the disease was due to poisonous air arising from the swamps, has been totally disproved. The fact is now well established that malaria is carried by certain mosquitoes which breed in the swamps. Preventive measures based on this fact are, therefore, definite and purposive, and are being widely and successfully employed.

The literature in which observations bearing on medical subjects are reported and thrashed out is of such enormous volume that no one mind can compass it. Even with the aid of periodicals which attempt to collect and classify this literature in the form of abstracts, the worker in one single little branch of a medical specialty is hard pushed to keep abreast of his subject. It is like a fusillade of bullets directed against our common enemy, "Disease". If many a bullet misses the mark, it is nevertheless true that now and then some do hit it squarely. Disease is slowly but surely being pushed back from trench to trench, and ultimate victory is only a matter of time, perseverance and concerted action.

In Hygienic Laboratory Bulletin No. 101 the U. S. Public Health Service publishes an article entitled "Complement Fixation In Tuberculosis", which neither in title nor in text can be expected to be in-

telligible to the layman. It is a summary of what has been done up to the present time in developing a test of the blood serum of persons and animals afflicted with tuberculosis, and it is believed that it will be of value to hospital and laboratory workers in tuberculosis who may not have time or opportunity to investigate the status of the subject for themselves. The methods of applying these tests have varied much with different workers, and the results have consequently not been entirely in harmony, although a strong tendency toward agreement in fundamentals is noted in the more recent articles. The tests are found to be highly specific, that is not to react with healthy and non-tuberculous persons, and to be comparatively free from the objection to some other tests, that they react with persons who at some time have had tuberculosis but have recovered from it. This article will have fulfilled its purpose if it shall assist in directing some of the bullets of the campaign against disease toward the spot where they will do the most good.

The Problem of Terminal Disinfection.

A few years ago fumigation was practiced as a routine after the more common communicable diseases such as diphtheria, scarlet fever, smallpox, and tuberculosis. Within the last decade a change of sentiment in regard to terminal disinfection has taken place. Chapin was the first to cast doubt upon the efficiency of fumigation, alleging that organisms discharged from a patient's body find such an unfavorable environment that they soon die and terminal disinfection is therefore unnecessary. He discontinued fumigation after certain of the communicable diseases and collected statistics to show that secondary cases were no more common when fumigation was omitted than when this additional precaution was practiced. In 1912 the New York City Health Department discontinued disinfection following diphtheria except the bedding and linen, which was removed to steam sterilizing plants. In case of removal of the patient to a hospital, or death, fumigation was still practiced. Later the department discontinued disinfecting the bedding and other linen. In cases of measles, whooping cough, acute poliomyelitis and epidemic cerebrospinal meningitis, the department does not practice disinfection except after or removed cases.

At the last conference of State and Provincial Boards of Health, Dr. Hasseltine seriously questioned the advisability of discontinuing terminal disinfection until further knowledge is accumulated. It is possible that the poor results of disinfection in the past have been due

to improper methods of disinfection rather than to the inefficiency of the measure itself. Those who have discontinued the use of terminal disinfection do not claim ideal results, and if even a small number of cases are prevented, the practice would still seem worth while. — *Abstr. J. A. M. A.*, 1915.

Public Health Service Discovers Cause and Cure of Pellagra.

PELLAGRA CAUSED BY INSUFFICIENT PROTEID DIET.

Announcement was made at the Treasury Department today that as a result of continued research and experiments of the Public Health Service, both the cause and the cure of pellagra have been discovered, and that the spread of this dread malady, which has been increasing in the United States at a terrific rate during the past few years, may now be checked and eventually eradicated. Assistant Secretary Newton, in charge of the Public Health Service, expressed great interest in the discovery and regards it as one of the most important achievements of medical science in recent years.

Pellagra has been increasing alarmingly throughout the United States during the last eight years, and it is estimated that 75,000 cases of the disease will have occurred in the United States in 1915, and of this number at least 7,500 will have died before the end of the year. In many sections only tuberculosis and pneumonia exceed it as a cause of death.

The final epoch-making experiment of the Public Health Service was carried out at the farm of the Mississippi State Penitentiary about eight miles east of Jackson, Miss., and together with the previous work of the Service completes the chain in the prevention and cure of the disease. The work at the Mississippi Farm has been in charge of Surgeon Joseph Goldberger and Assistant Surgeon G. A. Wheeler of the United States Public Health Service. The Farm consists of 3,200 acres in the center of which is the convict camp. The final experiment was undertaken for the purpose of testing the possibility of producing pellagra in healthy human white adult males by a restricted, one-sided, mainly carbo-hydrate (cereal) diet. Of eleven convicts who volunteered for this experiment, six developed a typical dermatitis and mild nervous gastro-intestinal symptoms.

Experts, including Dr. E. H. Galloway, the Secretary of the Mississippi State Board of Health, Dr. Nolan Stewart, formerly Superintendent of the Mississippi State Hospital for the Insane at Jackson, Dr. Marcus Hause, Professor of Dermatology, Medical Col-

lege of the University of Tennessee, Memphis, Tenn., and Dr. Martin R. Engman, Professor of Dermatology in the Washington Medical School, St. Louis, Mo., declare that the disease which was produced was true pellagra.

Prior to the commencement of these experiments no history could be found of the occurrence of pellagra on the penitentiary farm. On this farm are 75 or 80 convicts. Governor Earl Brewer offered to pardon twelve of the convicts who would volunteer for the experiment. They were assured that they would receive proper care throughout the experiment, and treatment should it be necessary. The diet given was bountiful and more than sufficient to sustain life. It differed from that given the other convicts merely in the absence of meats, milk, eggs, beans, peas, and similar proteid foods. In every other particular the convicts selected for the experiment were treated exactly as were the remaining convicts. They had the same routine work and discipline, the same periods of recreation and the same water to drink. Their quarters were better than those of the other convicts. The diet given them consisted of biscuits, fried mush, grits and brown gravy, syrup, corn bread, cabbage, sweet potatoes, rice, collards and coffee with sugar. All components of the dietary were of the best quality and were properly cooked. As a preliminary, and to determine if the convicts were afflicted with any other disease, they were kept under observation from February 4th to April 9th, two and a half months, on which date the one sided diet was begun.

Although the occurrence of nervous symptoms and gastrointestinal disturbances was noted early, it was not until September 12th, or about five months after the beginning of the restricted diet, that the skin symptoms so characteristic of pellagra began to develop. These symptoms are considered as typical, every precaution being taken to make sure that they were not caused by any other disease. The convicts upon whom the experiment was being made, as well as twenty other convicts who were selected as controls, were kept under continuous medical surveillance. No cases of pellagra developed in camp excepting among those men who were on the restricted diet. The experimenters have therefore drawn the conclusion that pellagra has been caused in at least six of the eleven volunteers as a result of the onesided diet on which they subsisted.

On the basis of this discovery, the States of Mississippi, Louisiana and Florida have laid their propaganda through their respective boards of health for the eradication of the disease.

First Successful Fight Against Hay-Fever.

WOMEN'S CIVIC LEAGUE ASSISTS.

After having started a campaign of public education in the United States, showing that hay-fever is due to the pollen of weeds and that fall hay-fever, the most common form, is due in almost all cases to the two varieties of rag-weed, the Common Rag-weed (*Ambrosia Artemisiifolia*) found in the Middle and Northern States and the Giant Rag-weed (*Ambrosia Trifida*) more common in the moist lands of the Coast, the American Hay-Fever-Prevention Association has concentrated its first efforts in New Orleans with the first inning to its credit.

The public was first educated regarding the rag-weeds, so that they could be easily recognized. Illustrations of the weeds were published in the Bulletin of the State Medical Board of Health and the public press, and the live weeds, in full development, were exhibited in the show-windows of the principal street.

The City of New Orleans, through the Commissioner of Public Works, placed at the disposal of the Association twenty convicts, who cleared the streets and sidewalks of the outer section of the City of the weeds, in accordance with a map prepared by the Topographical Committee of the Association showing the areas infected with rag-weed.

The State Board of Health published the illustrations of the rag-weeds and abstract of the instructions for hay-fever sufferers, and the City Board of Health assisted by enforcing the cutting of weeds on vacant lots. The Commissioners of the various Parks had the rag-weeds destroyed in the Public Parks under the direction of the Association.

Valuable assistance was given by the Women's Civic League, which appointed a special Committee on Vacant Lots. This Committee made arrangements with labor bureaus so that they not only reported lots infected with weeds but offered to send workmen to cut them at low rates.

The Storm of September 29th, completed the fall work of the American Hay-Fever-Prevention Association in New Orleans by almost entirely destroying the leaves and flowers of the Giant Rag-Weed in exposed places. As a result of this, and the efforts of the American Hay-Fever-Prevention Association, Hay-Fever in New Orleans practically disappeared several weeks earlier than the usual time. As there are about 5,000 hay-fever sufferers in that city, the health and economic value of this can easily be estimated.

Dr. W. Scheppegrell, President of the American Hay-Fever-Prevention Association states that what has been effected in New Orleans can be done in all other towns and cities, and efforts in this direction will be started in the Spring.

Hay-Fever is a distinctive preventable disease, and Dr. Scheppegrell believes that in a few years cases will become rare. The length of time will depend upon the degree to which localities are infected with the hay-fever-producing weeds and the energy of the people in destroying them.

In some of the smaller towns, especially those catering to summer visitors, this will probably be accomplished before next Summer. The statement that a town is free of hay-fever will prove an advertisement, that will easily repay the cost of destroying the hay-fever-producing weeds.

Figures on Drug Addiction.

Figures recently published by the United States Public Health Service indicate that the estimates of the number of drug users in the United States made in connection with the passage of the Harrison law, were grossly exaggerated. One person out of every fifty was said to be addicted to narcotics, and drug addiction was said to be common in the schools.

Martin I. Wilbert, technical assistant of Hygienic Laboratory, has worked out figures which show that the illegitimate use of drugs is much less than supposed. His figures are based on the total importations of opium and coca leaves into the country. Converting these reported quantities of the several drugs imported into average doses, it is found that we will have about 2,500,000,000 doses of opium, its alkaloids and its derivatives, and 325,000,000 doses of coca leaves and cocain. As Wilbert says, "The total illegitimate use cannot well exceed the total of the available material."

In Tennessee, the law of 1913 requiring the registration of drug addicts, has been strictly enforced. At the end of a year's operation, there were registered 2,370 addicts. The average consumption of morphine per day was 8.5 grains—or approximately 1,000 average doses per month—12,000 doses per year.

Taking the same ratio of addicts to population for the whole country, Mr. Wilbert concludes that there are in the United States about 118,000 morphia habitues, consuming approximately 1,416,000,000 average doses per year, leaving 1,084,000,000 average doses for legitimate use. Even taking the gross exaggeration of the alarmists that 90 per cent. of the opium imported into the United States is used

for addiction and not for legitimate medical purposes, at the Tennessee rate of 8.5 grains per day, the maximum number of users of opium, its derivatives and alkaloids in all parts of the United States, would not be more than 187,000.

In regard to cocain, Wilbert calculates that the possible number of addicts is 10,000. He takes the figures of C. G. Steinmetz, who finds that the daily consumption of cocain among addicts is from 20 to 60 grains. On the basis of 20 grains per day, the annual consumption of cocain by the addict would be 15 ounces. The total annual importation of cocain into the United States is 150,000 ounces. Accordingly, the total number of opium and cocain addicts of the United States is considerably less than 200,000 in a population of 100,000,000.

The Harrison law is a beneficent law, in that it has compelled most of those who are taking opium without legitimate excuse (such as the presence of cancer), to seek skilled aid in breaking away from the habit, and because it will certainly prevent almost entirely the formation of such habits by others in the future. The law has been, however, badly drawn in some respects, has many defects in phraseology, and includes an interdict upon many substances which are no more narcotics than is calomel.

Certain derivatives of opium are included in the provisions of the law as well as some "synthetic substitutes" for cocain, but these cannot be regarded as habit forming drugs.

Doubtless some day some body of men representing the medical and pharmaceutical profession, and capable of dealing with this whole subject in an intelligent manner, will revise the statute so that it will not only be a safe-guard against drug addiction but a comfort to the physician.—Abst. Lancet Clinic, 1915.

Cholera Prevalence Abroad Affects Quarantine Situation.

The United States Public Health Service has collected all available information regarding health conditions in foreign ports in order that needless restrictions shall not be imposed upon vessels, and that when necessary active measures may be taken. In a review of the world distribution of cholera, yellow fever, plague, and typhus fever, just issued by the United States Public Health Service, it is pointed out that during the fiscal year ended June 30, 1915, cholera was present in Austria-Hungary, Ceylon, China, Egypt, Dutch East Indies, India, the Phillippine Islands, Russia, the Straits Settlements, the Balkan Territory, Germany and Indo-China. The amount of cholera reported in Russia during the six months ended December 25, 1914,

and the absence this year of reports from that country, save from Petrograd during the six months following, indicates that the disease has been more or less widely prevalent there. During the six months ended June 25, 1915, cholera was reported to be present in the prison camps in Germany in twenty-three localities, in Silesia, and in Brandenburg, Posen, and Zirka, in Germany. In all probability these cases were traceable to the seat of war in the east. The new infection in the Balkan territory may have originated from the constant infection of Austria-Hungary or from Turkey, where cholera was reported prevalent during 1914 and 1915. From the Balkan territory, cholera has been carried into Italy, the disease being reported recently in and near Venice and Leghorn. As a result, quarantine officers have been warned to watch travel from the Greek, Italian and Holland ports with a view to the detection of active cases of cholera and of cholera carriers. With the cessation of hostilities in Europe there is every indication that the work and responsibilities of the quarantine system of the United States Public Health Service will be increased greatly.

REPORT OF THE DIVISION OF LABORATORIES, STATE DEPARTMENT OF HEALTH, FOR THE MONTH ENDING NOVEMBER 30, 1915.

Diphtheria: Positive 172, negative 469, suspicious 43.....	684
Tuberculosis: Positive 69, negative 202, unsatisfactory 1.....	272
Typhoid: Positive 16, negative 56, suspicious 11.....	83
Rabies: Positive 3, negative 4.....	7
Malaria: Negative 2, unsatisfactory 3.....	5
Water, Chemical examination.....	19
Water, Bacteriological	205
Milk	3
Food, Fertilizers, Miscellaneous, Drugs.....	119

Total number of examinations as above..... 1,387

Distribution of Outfits and Biological Products, for the Month Ending November 30, 1915.

Diphtheria	1,064
Tuberculosis	746
Typhoid	174
Malaria	21
Ophthalmia	1,600
Water, chemical 37, bacterial 165, qts. 12.....	214

Total number of outfits distributed..... 3,819

REPORTED CASES OF NOTIFIABLE COMMUNICABLE DISEASES, NOVEMBER 1915.

	<i>Townships and Villages.</i>		
	<i>Cities.</i>	<i>Villages.</i>	<i>Total.</i>
Tuberculosis (all forms).....	446	62	508
Pneumonia	198	106	304
Typhoid Fever	186	208	394
Diphtheria	1,012	444	1,456
Whooping Cough	347	419	766
Measles	373	306	679
Scarlet Fever	658	537	1,195
Chickenpox	400	356	756
Smallpox	137	79	216
Mumps	88	91	179
Gonorrhea	101	75	176
Syphilis	59	9	68
German Measles	2	10	12
Epidemic Cerebro-Spinal Meningitis.....	10	11	21
Acute Anterior Poliomyelitis	20	20	40
Malaria	2	....	2
Anthrax	1	....	1
Pellagra .....	....	1	1
Dysentery	1	....	1
Tetanus .....	....	1	1
Total	4,041	2,735	6,776

COMMUNICABLE DISEASES, NOVEMBER, 1915.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
ADAMS COUNTY—										
West Union	Vil.			1						
Bratton	Tp.			2						
Jefferson	Tp.	1	1	2						
Liberty	Tp.			1						
Meigs	Tp.	3		1						
Oliver	Tp.						8			
Scott	Tp.			3		2	1			
Sprigg	Tp.							25		
Tiffin	Tp.			5						
Winchester	Tp.						1			
ALLEN COUNTY—										
Delphos		1	1	2	26			1		
Lima			1	2	15	1	1	1		
Amanda	Tp.		2	1	8		1			
Perry	Tp.			1						
Sugar Creek	Tp.				4					
ASHLAND COUNTY—										
Ashland				1	1	2		3		
Savannah	Vil.							1		
Clear Creek	Tp.							1		
Jackson	Tp.		1							
Perry	Tp.		1							
ASHTABULA COUNTY—										
Ashtabula		1	1	7						
Conneaut			2							
Rock Creek	Vil.						1			
North Kingsville	Vil.		1							
Ashtabula	Tp.			2						
Austinburg	Tp.		1		1					
Colebrook	Tp.		1							
Denmark	Tp.							2		
Dorset	Tp.						1			
Geneva	Tp.	2								
Harpersfield	Tp.				3					
Hartsgrove	Tp.		1							
Lenox	Tp.		1				8			
Monroe	Tp.			4						
Morgan	Tp.						3	1		
New Lyme	Tp.			1						
Orwell	Tp.					8		2		
Pierpont	Tp.			12						
Saybrook	Tp.			2						
Trumbull	Tp.		3		25					
Wayne	Tp.		1							
Williamsfield	Tp.		1							
ATHENS COUNTY—										
Athens				3	4		1	1		
Nelsonville			3	8			1		4	
Amesville	Vil.						2			
Buchtel	Vil.			4						
Chauncey	Vil.						1			
Glouster	Vil.			2						
Jacksonville	Vil.			1						
Alexander	Tp.			1						
Ames	Tp.						8			
Berne	Tp.			1			4			
Dover	Tp.			6						
Lee	Tp.							11		
Lodi	Tp.		2	1						
Rome	Tp.			1						
Trimble	Tp.			5			1			
York	Tp.			4	1		2			

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
AUGLAIZE COUNTY—										
St. Marys					2		8	1		
Wapakoneta		1				1	4			
Buckland	Vil.			7						
German	Tp.	2								
Logan	Tp.			1						
BELMONT COUNTY—										
Bellaire		4	2	4	5	8	2	1		
Martins Ferry	1			7						
Barnesville	Vil.	1	1				3			
Bethesda	Vil.		3							
Brookside	Vil.		1							
Flushing	Vil.		1			1				
Morristown	Vil.	1								
Shadyside	Vil.	1	1					4		
Colerain	Tp.			8						
Goshen	Tp.						1			
Mead	Tp.		1				1			
Pultney	Tp.	1	2	2						
Richland	Tp.	1	3				5			
Washington	Tp.	1	2							
Wayne	Tp.						5			
BROWN COUNTY—										
Aberdeen	Vil.				8					
Ripley	Vil.							1		
Clark	Tp.						2			
Huntington	Tp.	1	2		2					
Pleasant	Tp.							8		
Scott	Tp.						2			
Sterling	Tp.	1				1				
Union	Tp.	1						1		
BUTLER COUNTY—										
Hamilton	4	1	2	5		2	9	8		
Middletown	2	3	5	11	2	2	1	1		
Oxford	Vil.			5						
Seven Mile	Vil.						1			
Lemon	Tp.			1						
Ross	Tp.				5					
CARROLL COUNTY—										
Carrollton	Vil.			1						
Augusta	Tp.						1			
Fox	Tp.						1			
Rose	Tp.						1			
Washington	Tp.				2					
CHAMPAIGN COUNTY—										
Urbana			1							
Mechanicsburg	Vil.	1								
North Lewisburg	Vil.							2		
Union	Tp.	2	2							
CLARK COUNTY—										
Springfield	11	1	10	6	1	1	7	8		
Enon	Vil.	1								
South Charleston	Vil.				2					
German	Tp.						1			
Madison	Tp.				8					
Mad River	Tp.		2							
Springfield	Tp.		1	3						
CLERMONT COUNTY—										
Amelia	Vil.	1								
Batavia	Vil.		4							
Milford	Vil.			2		1		2		
Moscow	Vil.									1
New Richmond	Vil.		1		2					
Williamsburg	Vil.					8				

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
CLERMONT COUNTY—Concluded.										
Goshen	Tp.				1			2		1
Jackson	Tp.				5	2				1
Miami	Tp.				8					
Monroe	Tp.				6					
Ohio	Tp.			1						
Tate	Tp.				3					
Wayne	Tp.			1						
CLINTON COUNTY—										
Chester	Tp.						2			
Jefferson	Tp.	1								
Union	Tp.		1							
COLUMBIANA COUNTY—										
East Liverpool			1	2	3		1			
Salem		1				1	6	3		
Wellsville				4	3		7			
Columbiana	Vil.						1			
East Palestine	Vil.	1	6			167				
Leetonia	Vil.			1		2				
Lisbon	Vil.		4	1	1	2		1		
New Waterford	Vil.				2					
Butler	Tp.	1						1		
Franklin	Tp.						1			
Hanover	Tp.			3				2		
Madison	Tp.		1							
Middleton	Tp.					2		18		1
Perry	Tp.						1			
Salem	Tp.						1			
Unity	Tp.		2			19				
West	Tp.						1			
COSHOCTON COUNTY—										
Coshocton				1			3			
Adams	Tp.						2			
Franklin	Tp.			1						
Mill Creek	Tp.		1							
Tiverton	Tp.						1			
Virginia	Tp.			3						
Washington	Tp.		1							
CRAWFORD COUNTY—										
Bucyrus			1				1			
Galion		2	1				1			
Chatfield	Vil.		1							
Crestline	Vil.		1							
Bucyrus	Tp.						1			
Jackson	Tp.		1							
Sandusky	Tp.				3					
CUYAHOGA COUNTY—										
Cleveland		114	127	20	268	35	147	146	65	24
East Cleveland			1	2		1	1		1	16
Lakewood		2				1	3			1
Bedford	Vil.					1				
Berea	Vil.				1		1			
Cleveland Heights	Vil.	1					4			
Olmsted Falls	Vil.							2		
Rocky River	Vil.		1		1		2	1		
West Park	Vil.				2	1				
Newburgh Heights	Vil.				3					
Brecksville	Tp.		1		1					
Brooklyn	Tp.				1					
Chagrin Falls	Tp.					1				
Middleburg	Tp.			1		2				
Strongsville	Tp.						3	2		
Warrensville	Tp.					10	3			

COMMUNICABLE DISEASES, NOVEMBER, 1915—Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
DARKE COUNTY—										
Greenville			1				7	3		
Burkettsville	Vil.			1			1			
Pittsburg	Vil.		1							
Union City	Vil.		2				1			
Versailles	Vil.				2		8			
Adams	Tp.						1			
Allen	Tp.			1				1		
Franklin	Tp.						4	1		
German	Tp.						3			
Jackson	Tp.						8			
Mississinawa	Tp.		10							
Monroe	Tp.			1						
Neave	Tp.						1			
Richland	Tp.						1			
Wayne	Tp.						2			
York	Tp.						2			
DEFIANCE COUNTY—										
Defiance		1		2					23	
Highland	Tp.								1	
DELAWARE COUNTY—										
Delaware				3			8			
Ashley	Vil.	2			14		2	1		
Ostrander	Vil.				15		1			
Concord	Tp.						1			
Delaware	Tp.						1			
Genoa	Tp.						1			
Oxford	Tp.						2			
Porter	Tp.						4			
Radnor	Tp.	1	1							
Scioto	Tp.	2			20		1			
Troy	Tp.				11					
ERIE COUNTY—										
Sandusky		2	2	7			3			
Florence	Tp.	1			2					
FAIRFIELD COUNTY—										
Lancaster			1	8			9			
Basil	Vil.		1							
Bremen	Vil.				2		1			
Pickerington	Vil.									
Berne	Tp.			2			1			
Greenfield	Tp.	1	1				1			
Liberty	Tp.						1			
Madison	Tp.	1		4			1			
Violet	Tp.			1			1			
Walnut	Tp.						10			
FAYETTE COUNTY—										
Washington C. H.		2								
Bloomingsburg	Vil.	1								
Octa	Vil.							1		
Taspen	Tp.						1	2		
Paint	Tp.						1			
Union	Tp.	1		1						
Wayne	Tp.				3		1			
FRANKLIN COUNTY—										
Columbus		41	7	166	7	8	46	23		
Bexley	Vil.			1						
Canal Winchester	Vil.						1			
Westerville	Vil.				7					
Blendon	Tp.				4					
Jackson	Tp.						1			
Marion	Tp.			3			1			
Mifflin	Tp.						4	2		
Norwich	Tp.						1			

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
FRANKLIN COUNTY—Concluded.										
Perry	<i>Tp.</i>							3		
Prairie	<i>Tp.</i>			1				1		
Truro	<i>Tp.</i>	1						4		
FULTON COUNTY—										
Chesterfield	<i>Tp.</i>						1			
German	<i>Tp.</i>		1							
GALLIA COUNTY—										
Gallipolis	<i>Tp.</i>	1								
Addison	<i>Tp.</i>		2	2						
Gallipolis	<i>Tp.</i>	2		1						
Green	<i>Tp.</i>		1							
Raccoon	<i>Tp.</i>	1								
GEAUGA COUNTY—										
Chardon	<i>Vil.</i>		1	1	3					
Chester	<i>Tp.</i>						3			
Thompson	<i>Tp.</i>						5			
GREENE COUNTY—										
Clifton	<i>Vil.</i>							2		
Osborne	<i>Vil.</i>			1						
Beaver Creek	<i>Tp.</i>						1			
Caesar Creek	<i>Tp.</i>			30				7		
Jefferson	<i>Tp.</i>							2		
Miami	<i>Tp.</i>					1				
Ross	<i>Tp.</i>				2					
Spring Valley	<i>Tp.</i>							4		
Xenia	<i>Tp.</i>			4						
GUERNSEY COUNTY—										
Cambridge	<i>Vil.</i>	1	3	2			5	1		
Byesville	<i>Vil.</i>							9		
Cumberland	<i>Vil.</i>						1			
Lore City	<i>Vil.</i>		3							
Senecaville	<i>Vil.</i>				1					
Cambridge	<i>Tp.</i>		1							
Center	<i>Tp.</i>							10		
Jackson	<i>Tp.</i>			1			1			
Knox	<i>Tp.</i>		3				1			
Richland	<i>Tp.</i>				1					
Valley	<i>Tp.</i>						3		2	
HAMILTON COUNTY—										
Cincinnati		117	4	5	166	33	21	25	67	1
Norwood				1	2			2	9	
St. Bernard				1				2		
Addyston	<i>Vil.</i>		2					1		
Arlington Heights	<i>Vil.</i>		1						1	
Cheviot	<i>Vil.</i>							3	4	
Cleves	<i>Vil.</i>							4		
Glendale	<i>Vil.</i>				1					
Lockland	<i>Vil.</i>				1				3	
Reading	<i>Vil.</i>				3			7	2	
Silverton	<i>Vil.</i>				1					
Harrison	<i>Tp.</i>					1				
Miami	<i>Tp.</i>						3			
Sycamore	<i>Tp.</i>						4		1	
Symmes	<i>Tp.</i>					9			2	
Whitewater	<i>Tp.</i>					2	15	2		
HANCOCK COUNTY—										
Findlay	<i>Vil.</i>	1		3	3		1	20	8	
Arlington	<i>Vil.</i>							1		
McComb	<i>Vil.</i>							1		
Amanda	<i>Tp.</i>							1		
Biglick	<i>Tp.</i>			1	1					
Delaware	<i>Tp.</i>					1	1			
Eagle	<i>Tp.</i>							5		

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
HANCOCK COUNTY—Concluded.										
Marion	Tp. 1						1			
Pleasant	Tp.									
Union	Tp.		1							
Washington	Tp.						1			
HARDIN COUNTY—										
Kenton				6			3			
Ada	Vil.		1							
Alger	Vil.		1	1						
Patterson	Vil.		1							
Ridgeway	Vil. 1		1							
Cessna	Tp.				3					
Dudley	Tp.						1			
Hale	Tp.						4			
McDonald	Tp. 1		1							
Marion	Tp.		1							
HARRISON COUNTY—										
Bowerston	Vil.						1			
Cadiz	Vil.		1							
Harrisville	Vil.		1				1			
New Athens	Vil.		1							
Freeport	Tp.			1						
Green	Tp.		1							
Moorefield	Tp.						1			
Washington	Tp.			1						
HENRY COUNTY—										
Deahler	Vil.			1						
Holgate	Vil.			2						
Flat Rock	Tp.		2							
Freedom	Tp.			1						
Pleasant	Tp.		4							
Washington	Tp.						1			
HIGHLAND COUNTY—										
Greenfield	Vil.	4		2			1			
Highland	Vil.						4			
Hillsboro	Vil.			1			3			
Leesburg	Vil. 1							2		2
Brush Creek	Tp.						2			
Concord	Tp.						2			
Liberty	Tp.						2			
Marshall	Tp.		1							
Paint	Tp. 1		1					2		
HOCKING COUNTY—										
Logan	Vil.			7			2			
Murray City	Vil.			1						
Benton	Tp.		4							
Good Hope	Tp.			1						
Ward	Tp.			9						
HURON COUNTY—										
Norwalk		1		2	1			5		
Greenwich	Vil.				3					
Greenfield	Tp. 1									
Peru	Tp.				7					
Ripley	Tp.							1		
JACKSON COUNTY—										
Wellston			2	13						
Coalton	Vil.						3			
Bloomfield	Tp.		1							
Jackson	Tp.						1			
Madison	Tp.						2			
Milton	Tp.			1						
JEFFERSON COUNTY—										
Steubenville	Vil. 1	1	8	14			6			
Bloomfield	Vil.	1								

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
JEFFERSON COUNTY— Concluded.										
Empire	Vul.			2						
Mingo Junction	Vul.							1		
Smithfield	Vul.						2			
Toronto	Vul.	1	4							
Island Creek	Tp.	1						5		
Saline	Tp.	1	2					1		
Wayne	Tp.			1						
Wells	Tp.			2						
KNOX COUNTY—										
Mt. Vernon			1				21			
Danville	Vul.	1								
Gambier	Vul.		1							
Clay	Tp.			1						
Clinton	Tp.						4			
Morris	Tp.			1						
Union	Tp.			1			1			
LAKE COUNTY—										
Mentor	Vul.		2							
Leroy	Tp.						2			
Madison	Tp.			1						
Mentor	Tp.		1							
LAWRENCE COUNTY—										
Ironton			3	2		2	1			
Coal Grove	Vul.			2						
South Point	Vul.	3								
Aid	Tp.		1							
Elizabeth	Tp.		1	4			1			
Fayette	Tp.		1	2						
Mason	Tp.		1	3						
Perry	Tp.		1	2						
Union	Tp.		1	2						
Upper	Tp.			1						
LICKING COUNTY—										
Newark		6	6	7		1	2	31		
Alexandria	Vul.			1			2			
Fallsburg	Tp.		1							
Harrison	Tp.		2							
Lima	Tp.						1			
Newark	Tp.						2		1	
Perry	Tp.			1						
St. Albans	Tp.			1			2			
LOGAN COUNTY—										
Bellefontaine		1	1	2	3	33	14	3		1
Rushsylvania	Vul.									
Harrison	Tp.				1					
Lake	Tp.						3			
McArthur	Tp.		1							
Rush Creek	Tp.						3			1
Stokes	Tp.				8					1
LORAIN COUNTY—										
Elyria			1	1	2	1	2	1		
Lorain		2	1	14	12	1	36	13		
La Grange	Vul.						4			
Wellington	Vul.	1								
Amherst	Tp.			2						
Black River	Tp.						1			
Carlisle	Tp.						1			
Henrietta	Tp.								1	
Huntington	Tp.			4						
La Grange	Tp.						3			
Ridgeville	Tp.	1		1	2		3			1

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board
of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
LUCAS COUNTY—										
Toledo	66	4	22	49	41	44	50	75	12	2
Adams	1					4				
Jerusalem	1								4	
Sylvania	1			2			1			
Washington	1	1	3					3		
MADISON COUNTY—										
London	1		2				1			
Mt. Sterling	1							2		
West Jefferson	1			3						
Darby	1						1			
Deer Creek	1						1			
Fairfield	1			1				1		
Jefferson	1			1						
Pleasant	1									
Somerford	1							4		
MAHONING COUNTY—										
Youngstown	19	20	10	13	30	43	29	11	75	3
Beloit	1			1						
Canfield	1			4						
East Youngstown	1			2			1			
Sebring	1			2						
Struthers	1	3		1	1			21	16	
Austintown	1							4		
Beaver	1									1
Berlin	1	1				1				
Boardman	1			1						
Cortsville	1			1					1	
Milton	1						1			
Poland	1							2	4	
Smith	1			1						
Springfield	1	2				40				
MARION COUNTY—										
Marion	1	2	4				3	6		
Larue	1							1		
Prospect	1				2		1			
Waldo	1				3					
Claridon	1									3
Pleasant	1						1			
Prospect	1					2	1	2		
Waldo	1			1						
MEDINA COUNTY—										
Le Roy	1				1					
Medina	1		1				2			
Wadsworth	1						1			
Brunswick	1							1		
Hinckley	1						1			
Lafayette	1				25			5		
Litchfield	1	1								
Westfield	1				3					
MEIGS COUNTY—										
Middleport	1			2			6			
Racine	1							10		
Chester	1			5	4					
Sutton	1	2	1				2			
MERCER COUNTY—										
Celina	1						1			
Coldwater	1			4						
Mendon	1							3		
Franklin	1						1		1	
Marion	1	1								
Recovery	1		1							

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
MIAMI COUNTY—										
Piqua		2	2				3	4		
Casstown	Vil.	1								
Covington	Vil.							1		
Potsdam	Vil.							3		
Tippecanoe City	Vil.							5		
West Milton	Vil.	1	1				3			
Concord	Tp.		1				6			
Lost Creek	Tp.	1					5			
Newberry	Tp.			4			1			3
Staunton	Tp.						2			
Union	Tp.	1					5			
MONROE COUNTY—										
Beallsville	Vil.						3			
Graysville	Vil.						1			
Green	Tp.							2		
Malaga	Tp.		1							
Ohio	Tp.	1								
Summit	Tp.					3				
Washington	Tp.						1			
Sunbury	Tp.					2				
MONTGOMERY COUNTY—										
Dayton		16	10	11	54	28	7	48	13	1
Brookville	Vil.					1		1		
Farmersville	Vil.							1		
Miamisburg	Vil.		3	1	1					
Butler	Tp.					4		1	5	
Clay	Tp.							1		
Harrison	Tp.	1								
Jackson	Tp.						15			
Jefferson	Tp.	1	2				3			
Madison	Tp.			5			3			
Mad River	Tp.			1			2			
Perry	Tp.		1							
Van Buren	Tp.					1				
Washington	Tp.			3			1			
MORGAN COUNTY—										
Chesterhill	Vil.							4		
Deavertown	Vil.						1			
Deerfield	Tp.					3				
Marion	Tp.							2		
Meigsville	Tp.			8						
Penn	Tp.	1						1		
Union	Tp.					15				
MORROW COUNTY—										
Marengo	Vil.						3	3		
Bennington	Vil.						2			
Perry	Tp.							1		
Peru	Tp.					1				
South Bloomfield	Tp.		1					10		
Washington	Tp.						11			
Westfield	Tp.			1						
MUSKINGUM COUNTY—										
Zanesville		3		1	9			6		
Falls	Tp.				3					
Muskingum	Tp.					1				
Newton	Tp.		1			2				
Perry	Tp.		1			6				
Springfield	Tp.						1			
Washington	Tp.			1						
Wayne	Tp.	1		1	1					1
NORLE COUNTY—										
Caldwell	Vil.							1		
Marion	Tp.	1								

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
NOBLE COUNTY—Concluded.										
Sharon	Tp.				30					
Wayne	Tp.		1		25					
OTTAWA COUNTY—										
Elmore	Vil.						1			
Port Clinton	Vil.		1							
Carroll	Tp.						1			
Catawba Island	Tp.		2							
Danbury	Tp.									12
PAULDING COUNTY—										
Antwerp	Vil.	1	1							
Broughton	Vil.			2						
Grover Hill	Vil.						3			
Payne	Vil.		1							
Brown	Tp.								3	
Jackson	Tp.			2						
Latty	Tp.			1			2			
PERRY COUNTY—										
Corning	Vil.		1							
Crooksville	Vil.							1		
Junction City	Vil.				4					
New Lexington	Vil.	1					1			
New Straitsville	Vil.						3			
Rendville	Vil.		1							
Shawnee	Vil.			1	4					
Santoy	Vil.	2	2							
Bearfield	Tp.			2						
Jackson	Tp.	4	1		7			6		
PICKAWAY COUNTY—										
Circleville	Vil.			7			1			
Ashville	Vil.							20		
Williamsport	Vil.	1								
Jackson	Tp.			3						
Scioto	Tp.	2								
PIKE COUNTY—										
Piketon	Vil.			2			1			3
Waverly	Vil.			9						
Jackson	Tp.		3	1						
Marion	Tp.		2	1						
Pebble	Tp.							2		
Pee Pee	Tp.		1							
PORTAGE COUNTY—										
Ravenna	Tp.	2	2	1	3		1			
Kent	Vil.			1			1			
Atwater	Tp.			1						1
Randolph	Tp.		1							
Ravenna	Tp.					1				
Suffield	Tp.		4							
PREBLE COUNTY—										
Lewisburg	Vil.				4					
Verona	Vil.									
Dixon	Tp.						1	3		
Lanier	Tp.	1					1			
Somers	Tp.							20		
PUTNAM COUNTY—										
Continental	Vil.			2						
Glandorf	Vil.		1							
Ottawa	Vil.		2	1						
Blanchard	Tp.						7			
Greensburg	Tp.						2			
Jackson	Tp.						1			
Ottawa	Tp.						5			
Union	Tp.		1				1			

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
RICHLAND COUNTY—										
Mansfield	1		1	3		1		2		31
Lexington	Vil.		1							
Perry	Tp.	1								
Troy	Tp.	1								
ROSS COUNTY—										
Chillicothe	1		3	24			1			
Kingston	Vil.	1					7			
Green	Tp.		1	1						
Harrison	Tp.			4						
Liberty	Tp.		1	1				1		
Paint	Tp.	1								
Paxton	Tp.		1							
Scioto	Tp.		1	2						
SANDUSKY COUNTY—										
Fremont	1	1	1		1			17		5
Madison	Tp.					2				
Washington	Tp.		1				1			
Woodville	Tp.		1							
SCIOTO COUNTY—										
New Boston	Vil.			1			3			
Bloom	Tp.						1			
Brush Creek	Tp.	1								
Clay	Tp.						2			
Greene	Tp.		1							
Harrison	Tp.		1	1			1			
Jefferson	Tp.				1					
Madison	Tp.						1			
Nile	Tp.			11			2			
Porter	Tp.	1	1	1						
Rush	Tp.			4			1			
Vernon	Tp.			1						
Washington	Tp.			4						
SENECA COUNTY—										
Fostoria						2	7			
Tiffin			1	1				1		
Adams	Tp.	1		1						
Bloom	Tp.	1								
Seneca	Tp.		1							
Thompson	Tp.									29
Venice	Tp.			1						
SHELBY COUNTY—										
Green	Tp.				1		1			
Loramie	Tp.						8			10
Orange	Tp.						1			
Perry	Tp.	1			1					
STARK COUNTY—										
Canton	4	3		17	2	34	25	7		
Massillon				11						
Louisville	Vil.			1						
Minerva	Vil.						4			
New Berlin	Vil.						1			
Osnaburg	Vil.						1			
Canton	Tp.					2	7			
Lake	Tp.		1							
Lexington	Tp.			1						
Nimishillen	Tp.	1			5	1	1			1
Osnaburg	Tp.			1						
Paris	Tp.						1			
Plain	Tp.			1			3			
SUMMIT COUNTY—										
Akron	16		20	31	1	7	37	3		
Barberton	1			6			2			
Cuyahoga Falls	Vil.		1	3			1			

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
SUMMIT COUNTY—Concluded.										
Kenmore	Vil.			3			2			
Macedonia	Vil.						1			
Mogadore	Vil.	1								
Peninsula	Vil.		1							
Bath	Tp.						1			
Coventry	Tp.			2						
Franklin	Tp.						1			
Norton	Tp.						1			
Portage	Tp.						7			
Richfield	Tp.			1						
Springfield	Tp.						1			
Tallmadge	Tp.						1	9		2
Twinsburg	Tp.							8		
TRUMBULL COUNTY—										
Niles		1	1	10						
Warren		1		6		38	2	2		
Girard	Vil.		1					1		
Hubbard	Vil.			2						
Mineral Ridge	Vil.			1						
Newton Falls	Vil.						1			
Bloomfield	Tp.							1		
Brookfield	Tp.						2			
Champion	Tp.					1				
Fowler	Tp.									20
Hartford	Tp.			1						
Hubbard	Tp.		1	2	10	3	1			1
Liberty	Tp.				1		1			
Lordstown	Tp.						6			
Southington	Tp.					20				
Vienna	Tp.	1								
Warren	Tp.			2		1				
Weathersfield	Tp.			2						
TUSCARAWAS COUNTY—										
Canal Dover			1	3			8			
New Philadelphia		2		3			17		18	
Barnhill	Vil.			1					1	
Dennison	Vil.		1	4						
Mineral City	Vil.							2		
Newcomerstown	Vil.						4			
Strasburg	Vil.			6						
Tuscarawas	Vil.								4	
Uhrichsville	Vil.			6			7			
Dover	Tp.			1						
Franklin	Tp.			5	1		1			
Goshen	Tp.			4					1	
Lawrence	Tp.			6						
Mill	Tp.						1			
Oxford	Tp.						1			
Sandy	Tp.									
Warwick	Tp.		2						1	
UNION COUNTY—										
Marysville	Vil.			3				5		
Richwood	Vil.						1			
Unionville Center	Vil.							2		
Allen	Tp.		2				1			
Claibourne	Tp.					1	1			
Darby	Tp.							3		
Jackson	Tp.				6					
Liberty	Tp.		1				1			
Mill Creek	Tp.				11					
Paris	Tp.						3	1		
Union	Tp.	1								
Washington	Tp.						5	4		

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Continued.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
VAN WERT COUNTY—										
Van Wert					75					
Ohio City	<i>Vil.</i>	1								
Jackson	<i>Tp.</i>				1					
Ridge	<i>Tp.</i>				1					
Washington	<i>Tp.</i>		1							
VINTON COUNTY—										
McArthur	<i>Vil.</i>			1			1			
Vinton	<i>Tp.</i>	1								
WARREN COUNTY—										
Franklin	<i>Vil.</i>			1						
Lebanon	<i>Vil.</i>							4		
Clear Creek	<i>Tp.</i>						1			
Hamilton	<i>Tp.</i>		1					2		1
Salem	<i>Tp.</i>			1			5			
Turtle Creek	<i>Tp.</i>							2		
Union	<i>Tp.</i>					2				
Washington	<i>Tp.</i>		2			2	9			
Wayne	<i>Tp.</i>						2			
WASHINGTON COUNTY—										
Marietta				1			4			
Belpre	<i>Vil.</i>			1						
New Matamoras	<i>Vil.</i>		2							
Dunham	<i>Tp.</i>						1			1
Grandview	<i>Tp.</i>		2							
Lawrence	<i>Tp.</i>						1			
Salem	<i>Tp.</i>							1		
Warren	<i>Tp.</i>	1		1			2			
Watertown	<i>Tp.</i>					1				
WAYNE COUNTY—										
Congress	<i>Vil.</i>	1								
Creston	<i>Vil.</i>							1		
Doylestown	<i>Vil.</i>		1	2						
Marshallville	<i>Vil.</i>			1						
Orrville	<i>Vil.</i>			1						
Rittman	<i>Vil.</i>						2			
Baughman	<i>Tp.</i>	2								
Chippewa	<i>Tp.</i>		5							
Congress	<i>Tp.</i>	1	1							
Milton	<i>Tp.</i>						1			
WILLIAMS COUNTY—										
Bryan	<i>Vil.</i>		1				4			
Edgerton	<i>Vil.</i>							2		
Montpelier	<i>Vil.</i>			1				1		
Stryker	<i>Vil.</i>	1	1							
Bridgewater	<i>Tp.</i>							1		
Florence	<i>Tp.</i>		1							
Madison	<i>Tp.</i>					2				
Northwest	<i>Tp.</i>								1	
WOOD COUNTY—										
Bowling Green			2	1			3		2	
Bloomdale	<i>Vil.</i>		1							
Haskins	<i>Vil.</i>								4	
Milton Center	<i>Vil.</i>							2		
Perrysburg	<i>Vil.</i>						5			
Portage	<i>Vil.</i>		1							
Tontogany	<i>Vil.</i>								11	
Walbridge	<i>Vil.</i>			2						
Center	<i>Tp.</i>		5					1		
Henry	<i>Tp.</i>						5			
Liberty	<i>Tp.</i>						3			
Middleton	<i>Tp.</i>						2			
Perry	<i>Tp.</i>									
Perrysburg	<i>Tp.</i>						4			

COMMUNICABLE DISEASES, NOVEMBER, 1915 — Concluded.

This Table Records Cases of Specified Diseases Reported to the State Board of Health for the Month of November, 1915.

Health District.	Tuberculosis (All Forms).	Pneumonia.	Typhoid Fever.	Diphtheria.	Whooping Cough.	Measles.	Scarlet Fever.	Chickenpox.	Smallpox.	Mumps.
WOOD COUNTY—Concluded—										
Plain .....Tp.	1	.....	.....	.....	1	.....	.....	.....
Portage .....Tp.	2	.....	.....	.....	.....	.....	.....
Ross .....Tp.	1	.....	.....	.....	.....	.....	.....
Washington .....Tp.	14	.....
Weston .....Tp.	1	.....	.....	.....	.....	.....	.....
WYANDOT COUNTY—										
Carey .....Vil.	2	.....	.....	.....	.....	.....	.....
Upper Sandusky .....Vil.	1	.....	.....
Antrim .....Tp.	2	.....	.....	.....	.....	.....	.....
Crane .....Tp.	1	.....	.....	.....	.....	.....	.....
Marseilles .....Tp.	1	.....	.....	.....	.....	.....	.....	.....	.....

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, NOVEMBER, 1915.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
ADAMS COUNTY—								
Meigs <i>Tp.</i>	2							
ASHTABULA COUNTY—								
Dorset <i>Tp.</i>			1					
ATHENS COUNTY—								
Athens 2								
Buchtel <i>Vil.</i>			1			1		
AUGLAIZE COUNTY—								
St. Marys 1								
BELMONT COUNTY—								
Bellaire 3								
Brookside <i>Vil.</i>	2							
Fultney <i>Tp.</i>	1							
BROWN COUNTY—								
Perry <i>Tp.</i>				1		1		
BUTLER COUNTY—								
Hamilton 1							1	
Middletown 1						1	1	
CLARK COUNTY—								
Springfield 2								
CLERMONT COUNTY—								
Mifflord <i>Vil.</i>	1							
Monroe <i>Tp.</i>		1						
COLUMBIANA COUNTY—								
East Liverpool 1		1				2		
Lisbon <i>Vil.</i>	1							
New Waterford <i>Vil.</i>					1	1		
CRAWFORD COUNTY—								
Chatfield <i>Vil.</i>					1			
CUYAHOGA COUNTY—								
Cleveland 1	6			2	13	66	2	a ² b ¹
Euclid <i>Tp.</i>			1					
DARKE COUNTY—								
Greenville 1								
DEFIANCE COUNTY—								
Defiance 1								
Hicksville <i>Tp.</i>					1			
DELAWARE COUNTY—								
Brown <i>Tp.</i>								c ¹
Delaware <i>Tp.</i>	2							
ERIE COUNTY—								
Sandusky 1								
FAIRFIELD COUNTY—								
Greenfield <i>Tp.</i>	7	1						
Walnut <i>Tp.</i>						1		
FAYETTE COUNTY—								
Union <i>Tp.</i>	2							
FRANKLIN COUNTY—								
Columbus 1						6		
FULTON COUNTY—								
Delta <i>Vil.</i>				1				
GALLIA COUNTY—								
Gallipolis <i>Tp.</i>	1							
GREENE COUNTY—								
Jefferson <i>Tp.</i>			1					
GUERNSEY COUNTY—								
Cambridge 1	3							
Cambridge <i>Tp.</i>								d ¹
Madison <i>Tp.</i>	1							
HAMILTON COUNTY—								
Cincinnati 14	16	1	3		1	2		
Whitewater <i>Tp.</i>	1	1						
HARDIN COUNTY—								
Ridgeway <i>Vil.</i>				1				

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, NOVEMBER, 1915 — Continued.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
HARRISON COUNTY—								
Cadiz .....Tp.	1							
HENRY COUNTY—								
Damascus .....Tp.	2	1						
HIGHLAND COUNTY—								
Greenfield .....Vil.	4							
Brush Creek .....Tp.		1						
HOCKING COUNTY—								
Logan .....Vil.				1				
HURON COUNTY—								
Bellevue .....Tp.					1			
New London .....Vil.					1			
JACKSON COUNTY—								
Jackson .....Tp.						1		
JEFFERSON COUNTY—								
Steubenville .....Tp.		1						
Cross Creek .....Tp.	1		1					
Wayne .....Tp.						1		
KNOX COUNTY—								
Berlin .....Tp.	1							
Jackson .....Tp.	2							
LICKING COUNTY—								
Hartford .....Tp.	5							
Lima .....Tp.	3							
LOGAN COUNTY—								
McArthur .....Tp.						1		
LORAIN COUNTY—								
Elyria .....Tp.							1	
Lorain .....Tp.	1	1	1		2	1		
LUCAS COUNTY—								
Toledo .....Tp.	32	22				8	7	
Waterville .....Vil.	1							
MAHONING COUNTY—								
Youngstown .....Tp.	7					3	1	
East Youngstown .....Vil.					3		3	
Sebring .....Vil.				1				
Struthers .....Vil.							2	
Milton .....Tp.	1							
MARION COUNTY—								
Marion .....Tp.						1		
MEDINA COUNTY—								
Medina .....Vil.	1							
Wadsworth .....Vil.				1	2			
Lafayette .....Tp.					4			
York .....Tp.					1			
MEigs COUNTY—								
Sutton .....Tp.		1						
MIAMI COUNTY—								
Piqua .....Tp.			2					1
West Milton .....Vil.								
Lost Creek .....Tp.	1							
MONROE COUNTY—								
Ohio .....Tp.					1			
MONTGOMERY COUNTY—								
Dayton .....Tp.	7	3		5				
Madison .....Tp.				1				
Perry .....Tp.	1					1		
Penn .....Tp.	1							
MUSKINGUM COUNTY—								
Zanesville .....Tp.					2		1	
Painesburg .....Vil.		2						
Newton .....Tp.	2							
PERRY COUNTY—								
New Lexington .....Vil.	1							

NUMBER AND DISTRIBUTION OF REPORTED CASES OF COMMUNICABLE DISEASES NOT INCLUDED IN THE GENERAL TABLE, NOVEMBER, 1915 — Concluded.

Health District.	Gonorrhea.	Syphilis.	German Measles.	Epidemic Cerebro-spinal Meningitis.	Acute Anterior Poliomyelitis.	Ophthalmia Neonatorum.	Trachoma.	Other Notifiable Diseases.
PIKE COUNTY—								
Perry <i>Tp.</i>	1							
PORTAGE COUNTY—								
Edinburg <i>Tp.</i>					1			
Randolph <i>Tp.</i>	1							
PREBLE COUNTY—								
Dixon <i>Tp.</i>							6	
PUTNAM COUNTY—								
Columbus Grove <i>Vil.</i>			1					
Pleasant <i>Tp.</i>			1					
RICHLAND COUNTY—								
Mansfield	7	4						
Shelby <i>Vil.</i>	1							
Mifflin <i>Tp.</i>					2			
ROSS COUNTY—								
Chillicothe	7	1				1		
SANDUSKY COUNTY—								
Fremont	1							
SCIOTO COUNTY—								
New Boston <i>Vil.</i>	4	1						
Brush Creek <i>Tp.</i>							1	
SENECA COUNTY—								
Liberty <i>Tp.</i>	1							
SHELBY COUNTY—								
Van Buren <i>Tp.</i>					1			
STARK COUNTY—								
Canton							1	
Osnaburg <i>Tp.</i>	1							
SUMMIT COUNTY—								
Akron					2		2	
TRUMBULL COUNTY—								
Warren	1							
Newton Falls <i>Vil.</i>						1		
Weathersfield <i>Tp.</i>				1				
TUSCARAWAS COUNTY—								
Canal Dover						1		
New Philadelphia	11					1		
Mineral City <i>Vil.</i>	1					1		
UNION COUNTY—								
Magnetic Springs <i>Vil.</i>				1				
VAN WERT COUNTY—								
Ohio City <i>Vil.</i>	1					1		
York <i>Tp.</i>	1							
VINTON COUNTY—								
Swan <i>Tp.</i>	1							
WASHINGTON COUNTY—								
Dunham <i>Tp.</i>	4							
Warren <i>Tp.</i>	5		1					
WAYNE COUNTY—								
Baughman <i>Tp.</i>					1			
Congress <i>Tp.</i>				2				
WOOD COUNTY—								
Ross <i>Tp.</i>	2							
WYANDOT COUNTY—								
Wharton <i>Vil.</i>	1							
Jackson <i>Tp.</i>	1							

a Malaria; b Anthrax; c Pellagra; d Tetanus; e Dysentery.

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Annual Reports.

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*Sanitary Record (Monthly), 1888 to 1894. Vol. 1 to Vol. 7.

*Ohio Sanitary Bulletin (Quarterly), 1895 to 1896. Vol. 1 and 2.

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*Sources of Public Water Supplies of Ohio, Preliminary Reports. Vols. 1-5. 1897 to 1902 inclusive.

*Water and Sewage Purification in Ohio. 1 Vol. 1908.

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Laws of Ohio Relating to the Powers and Duties of Boards of Health. 91 pp. 1912.

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Same. For Village Boards of Health. 14 p. James E. Bauman.

Same. For Village Health Officers. 16 p. James E. Bauman.

Orders and Regulations for Village and Townships, by James E. Bauman, 8 p. Reprint Monthly Bulletin, August 1914.

* Out of print.

- The Expenses of Boards of Health**, by James E. Bauman, 14 p. Reprint Monthly Bulletin, November, 1913.
- The Conservation of Public Health**, by E. F. McCampbell, 16 p. Reprint Monthly Bulletin, January, 1914.
- The Relationship of the Dentist to the Problems of Public Health**, by E. F. McCampbell, 12 p. Reprint Monthly Bulletin, February, 1914.
- The Notification of Reportable Diseases**, by James E. Bauman. Reprint Monthly Bulletin, April, 1914.
- Legal Procedures a Nurse Should Know**, by James E. Bauman, 6 p. Reprint Monthly Bulletin, June, 1914.
- Rural Sanitation**, by John W. Hill, 7 p. Reprint Monthly Bulletin, July, 1914.
- Relation of the Funeral Director and Embalmer to the Public Health**, by E. F. McCampbell, 10 p. Reprint Monthly Bulletin, July, 1914.
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